The Journal of the
American Medical Association

VOL. XXIX. CHICAGO, ILL., OCTOBER 23, 1897. No. 17.

ADDRESS.

MENTAL EVOLUTION IN MAN.

An address delivered at the opening of the Section of Psychology, at the Sixty-fifth Annual Meeting of the British Medical Association, Montreal, Aug. 31 to Sept. 4, 1897.

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[Abstract from advance sheets of the British Medical Journal.]

About sixty years ago, in the time of the Millerite excitement, a man who believed that the world was about to end expressed his fears to Emerson, who replied that it was really a matter of little consequence, "for," said he, "we can do very well without it." There are wise men who teach that each man creates the world he lives in, and as he gives it its substance so also does he give it its quality, insomuch that it is good or bad as he is good or bad. Be this as it may, it is certain that each one of us is of more consequence to himself than is all the outside world. Not only so, but the essential part of each man is what we call his mind, in comparison to which the body is an insignificant factor.

The study of psychology.—Psychology ought to be the most interesting of all the sciences, and as a matter of fact it undoubtedly is, though it has been greatly discredited by the imperfection of the method by which it has until very lately been studied. That imperfection is so great that it would hardly be an exaggeration to assert that nearly all the study and thought expended upon it down to the beginning of our own age has been fruitless and as good as wasted, except inasmuch as it has at last made clear the impassability of the route men have sought to follow, the route, namely, of introspection. For we might as well study the human body alone without reference to that of any other creature and attempt in that way to decipher its genesis, development and meaning as to attempt to comprehend a single human mind without including in our examination not only other human minds in all stages of evolution, but equally all other minds to which our own is related, that is to say, all minds other than human belonging to our kinsfolk, the animals, minds which stand today like mile posts along the almost infinite length of the path which our mind has followed in its upward march across the immensities and eternities from its remote infancy to the present hour; minds which in a thousand faculties represent to us everywhere, in infinite sameness and variety, *replicas* of our own or of parts of our own, showing us, as the poet says, tokens of ourselves which we "negligently dropped as passed that way huge times ago."

Comparative psychology.—As man's bodily life rests upon and grows from that of countless prehuman ancestors; as man includes in his structure the heart of the reptile, the gills of the fish, as well as the forms in outline of innumerable still lower races, so is his so-called human mind rooted in the senses and instincts of all his ancestral species; and not only so, but these senses and instincts still live in him, making up, indeed, far the larger part of his current every-day life; while his higher psychic life is merely the outgrowth and flower of them.

As truly as the plant is an embodiment of inorganic matter vivified by the transmuted forces which in the non-vital world about us we call light and heat, so truly is man's mind the outcome of—the expansion and culmination of—the imperfect sensation of the worm, the rudimentary sight, hearing and taste of the fish and reptile; and the simple consciousness which, springing from these, passed to us after almost infinite ages of slow evolution and amelioration through tens of thousands of generations of placental mammals, our immediate progenitors.

In the growth of mind, whether that of the race or of an individual, we recognize two distinct processes: 1. The very gradual evolution to or toward perfection of faculties that have already come into existence. 2. The spring into existence of faculties which had previously no existence. For it is clear no faculty (as no organ) came into mature and perfect life at once. Hearing and sight, we are told, developed by slow degrees from the sense of touch; and in the region of the intellect conceptual life was born from ages of receptual, and that from milleniums of perceptual.

Mental growth in the individual and in the race.—Let us now suppose mind growing for millions of years in the way set forth. It begins, we will say, as mere excitability; to that after a long time is added what may be called discrimination, or choice and rejection of, for instance, different kinds of food. After another long interval of almost infinitely slow advance sensation appears, and with it the capacity of pleasure and of pain; then, later still, memory; by-and-by recognition of offspring; and successively thereafter arise reason, recognition of individuals and communication of ideas. Concurrently with these intellectual faculties certain moral functions, such as fear, surprise, jealousy, anger, affection, play, sympathy, emulation, pride, resentment, grief, hate, revenge, shame, remorse and a sense of the ludicrous have also arisen in the nascent mind. We have reached now the mental plane of the higher animals, which is equally that of the human being at about 2 years of age. Then occurs in the child the mental expansion which separates man from the higher mammals—for something like a year the child mind steadily grows from the status of the latter to the status of the human mind. This year in the individual, during which it walks erect, but possesses a receptual intelligence only, not having yet the power of forming either concepts or true words, represents in the race the age of the *alalus homo*, the period of perhaps a hundred thousand years, during which our ancestors walked

erect, but not having self-consciousness had no true language. At the average age of 3 years in the individual self-consciousness is born and the infant from the point of view of psychology has become a human being. But we all know that after the attainment of the distinctively human faculty, self-consciousness, the child has still much to acquire both in the way of the expansion of already possessed faculties and in the acquisition of new ones before it is mentally a mature man. Of the numerous faculties which it still has to acquire I shall only mention here the color sense, the sense of fragrance, the human moral nature and the musical sense.

That basic and master human faculty, self-consciousness, occurs, as said, at about the average age of 3 years, but when it first made its appearance in the race it must have done so at full maturity; perhaps at the age of 20, both life and childhood being shorter at that time than they are today. You will see at once why I say self-consciousness must have occurred at first at maturity. Its acquisition at a given epoch supposed a higher mental life than had hitherto existed—such higher life on the part of the race could not have come to the individual before his maturity. To suppose that, it would be a contradiction in terms. The human mind attains its high water mark at maturity (that is what the word means), and one generation could not reach before maturity what the preceding generation had not reached at all. But self-consciousness occurs today at 3 years of age, and we only reach full mental maturity (on the average) at the age of 35. The advance, then, made by the individual from the age of 3 to that of 35, represents the advance of the race between the date of the appearance of self-consciousness and today, the mental status of the 3-year old child today being the mental status of the adult when self-consciousness first appeared. How long has it taken the human mind to grow from mere self-consciousness to its present stature? Not less certainly than several hundred thousand years, the time during which man has inhabited the earth.

Of all the mental faculties below self-consciousness each one has its own time for appearing in the human infant; as, for instance, memory and simple consciousness appear within a few days after birth, curiosity ten weeks after, use of tools twelve months after, shame, remorse and a sense of the ludicrous, all of them about fifteen months after. It is to be noted that in every instance the time of the appearance of a faculty in the infant corresponds with the stage at which the same faculty appears (as far as can be at present ascertained) in the ascending animal scale; for instance, memory and simple consciousness occur in animals as primitive as the echinodermata, while the use of tools is not met with below monkeys, and shame, remorse and a sense of the ludicrous are almost, if not entirely, confined (among animals) to the anthropoid ape and the dog.

As in prehuman so in human psychology, each superadded faculty was acquired in its own time in the history of the race, and that historic period corresponds with the time in the life of the individual into whom the faculty is born today. For instance, self-consciousness appears in the individual at the age of about 3 years—it appeared in the race several hundred thousand years ago. It has been proved by Geiger and others that our color sense was acquired by the race not more than 30,000 years ago. It is acquired by the individual at the age of about 5 or 6. It is thought that the sense of fragrance was acquired by the race later than the color sense; it is also acquired later by the individual. Our human moral nature can not be more than 10,000 years old, for a careful consideration of the records that have come down to us from the early Romans, Hellenes, Hebrews, Egyptians, Assyrians and Babylonians would indicate that as we go back into the past, this faculty tapers down toward the vanishing point, and that if it continues so to taper as we ascend the ages, all of what we distinctively call our human moral nature would certainly have disappeared by the time we had gone back the number of centuries mentioned—that is 10,000 years.

Today the human moral nature in the individual, instead of being born at the age of 3 years as is self-consciousness, or at 5 or 6 as is the color sense, does not come into existence before the average age of about 15 years. As to the musical sense, it is almost certainly less than 5,000 years old in the race, and when it occurs at all, is not usually born in the individual before adolescence.

There are three other laws which govern the acquisition of new faculties by any given race, viz.:

1. The longer a race has been in possession of a given faculty the more universal will that faculty be in the race.

2. The longer a race has been in possession of a given faculty the more firmly is that faculty fixed in each individual of the race who possesses it. In other words: The more recent is any given faculty the more easily is it lost.

3. A study of dreaming seems to reveal the fact that in sleep such mind as we have differs from our waking mind, especially by being more primitive; that in fact it would be almost strictly true to say that in dreams we pass backward into a prehuman mental life; that the intellectual faculties which we possess in dreams are, especially, recepts as distinguished from our waking concepts; while in the moral realm they are those faculties such as remorse, shame, surprise, along with the older and more basic sense functions, which belonged to us before we reached the human plane, and that the more modern mental faculties such as color sense, musical sense, self-consciousness, the human moral nature, have no existence in this condition, or if any of them do occur, it is only as a rare exception.

Let us now compare a few of the faculties which have been already mentioned in the light of the rules laid down. This will give us a definite notion of the growth of mind by the successive addition of new functions. For this purpose we will take simple consciousness, shame, self-consciousness, color sense, the human moral nature and the musical sense.

Simple consciousness.—Simple consciousness makes its appearance in the human infant at the age of a few days; it is absolutely universal in the human race; it dates back certainly to the earliest mammals and probably much earlier; it is only lost in deep sleep and coma; it is present in all dreams.

Shame.—Shame is said to be born in the human infant at the age of fifteen months; it is a prehuman faculty, being found in the dog and in apes, and undoubtedly existed in our prehuman ancestry; it is almost universal in the race, being only absent in the lowest idiots; it is very common in dreams.

Self-consciousness.—Self-consciousness makes its appearance in the child at the average age of three years; it is not present in any species but the human;

it is, in fact, that faculty the possession of which by an individual constitutes him a man. It is not universal in our race, being absent in all true idiots; that is, it is permanently absent in about one in each thousand human beings born into the world. In our ancestry it dates back to the first true man; a race, we are told, unclothed, walking erect, gregarious, without a true language, to a limited extent tool-using, destitute of marriage, government or of any institution; animal, but in virtue of its highly developed receptual intelligence, king of animals, which developed self-consciousness and by that fact became man. It is impossible to say how long ago it was when this event occurred, but it could not have been less than several hundred thousand years. This faculty is lost much more easily and frequently than is simple consciousness. We lose it in coma and also often in the delirium of fever; in certain forms of insanity, as in mania, it is often lost for weeks, even months, at a time; and lastly, it is never present in dreams.

Color sense.—This faculty appears in the individual at the average age of about five years. It is absent in one adult human being out of every forty-seven; it appeared in our ancestors, as Geiger has shown from linguistic paleontology, in the Aryan period probably less than thirty thousand years ago. It is seldom present in dreams, and when it does occur, that is, when any color is seen in a dream, it is generally that color which for good reasons was first perceived by man, namely, red.

Moral nature.—The human moral nature belongs to a much later stage of evolution than any of the faculties so far considered. It does not make its appearance in the individual before the average age of fifteen years. It is congenitally and permanently absent in at least forty human beings out of every thousand. It would seem clear, as stated already, from a consideration of our historic ancestors, from the fact that this faculty rapidly fades out as we ascend into the past, that it can not have existed in the race more than ten thousand years at the most. It is far more unstable in the individual than older faculties such as self-consciousness. It is never present in dreams.

Musical sense.—The musical sense does not appear in the individual before the average age of about twenty years; does not exist in more than half of the members of the race; has existed less than five thousand years in the race, and is never, or almost never, present in dreams, even in the case of professional musicians.

The scheme of mental evolution.—You now clearly see the scheme upon which I suppose the mind (as far as we have got) to have been built. I say advisedly "as far as we have got," because, if the mind has grown in the way set forth, it is still growing and is not built but is in the act of building. No man can ever say positively that his theory (of any fact) is the true one, but I am prepared to say of the above hypothesis that, if it be accepted, it will enable us to understand something of the phenomenon of mind as we observe it, whereas if we should prefer to hold as many do, that the human mind was created independently of any that preceded it by a *fiat* and *per saltum*, then I say deliberately that there is and can be no such thing as a science of psychology, and that every attempt to investigate or explain, to comprehend or divine the *rationale* of the facts observed as to its origin and growth in the individual must remain for ever futile. And if I could find the right words I would bring home to each one who hears me the inextinguishable conviction that, in this idea of evolution, lies enfolded the mystery of the past, the explanation of the present, and the sure prescience of the future—what we were, what we are and what we shall be.

The atavistic theory of idiocy and insanity.—In conclusion, I desire to refer briefly to two corollaries which flow from this hypothesis. The first is, that if it is correct, then all forms of insanity, including all forms of idiocy, are nothing more or less than cases of atavism. In this view insanity is due to congenital absence or imperfection (leading to breakdown) of some faculty or faculties, such absence or imperfection being due to more or less complete reversion to an ancestral type. In my opinion, this view explains insanity and its numerous forms more completely than these can be explained from any other point of view. Upon this view the comparatively recent origin and rapid evolution of the human mind, and especially the rapid mental evolution of the so-called Aryan peoples in the last four or five thousand years, is almost solely responsible for the large number of cases of insanity in the modern civilized world, since the stability of any form, function or faculty in any race is dependent upon the time it has existed in that race, and therefore the more recent a faculty is in a race the more frequently will it be found absent, defective or unstable in the individuals of the race.

Future development of mind.—The second corollary, which is even more important than the first, is that, upon the view here set forth, the human mind at present is not formed, but forming; is not completed, but in process of construction. By slow and dubious steps taken in darkness our remote ancestors wearily climbed to simple consciousness. After another immense interval they reached self-consciousness. But that can not be the end—the cosmic process can not stop there—can not, indeed stop anywhere. Evolution, as far as we can see, has always gone on, is going on today and will always go on. Our old mental faculties are some of them fading out, others advancing toward greater perfection, and alongside of them new ones are springing up, some of which will, without doubt, be of overshadowing importance in the future.

So-called telepathy and clairvoyance seem to be specimens of such nascent faculties. I place in the same class the phenomena of what is often named spiritualism. The labors of the Society for Psychic Research have made it plain to me that these phenomena, as notably in the case of W. Stainton Moses, really exist. And I think a study of the above-mentioned case, together with that of Mrs. Piper and that of Mary J. Fancher of Brooklyn, would compel any unprejudiced person to make the same admission. But to me these are not cases in which outside agents are acting on or through a human being, but are cases in which a given human being has faculties which are not commonly possessed. Whether any given faculty, such as one of those now alluded to, shall grow, become common and finally universal in the race, or wither and disappear, will depend upon the general laws of natural selection and upon whether the possession of the nascent faculty is advantageous or not to the individual and to the race.

But of infinitely more importance than telepathy and so-called spiritualism (no matter what explanation we give of these or what their future is destined to be) is the final fact to be here touched upon.

This is, that superimposed upon self-consciousness, as is that faculty upon simple consciousness, a third and higher form of consciousness is at present making its appearance in our race. This higher form of consciousness, when it appears, occurs at the full maturity of the individual, at about the age of 35, but almost always between the ages of 30 and 40. There have been occasional cases of it for the last 2,000 years, and it is becoming more and more common. In fact, in all respects, as far as observed, it obeys the laws to which every nascent faculty is subject. Many more or less perfect examples of this new faculty exist in the world today, and it has been my privilege to know personally and to have had the opportunity of studying several men and women who have possessed it. In the course of a few more milleniums there should be born from the present human race a higher type of man possessing this higher consciousness. This new race, as it may well be called, would occupy, as toward us, a position such as that occupied by us toward the simple conscious *alalus homo*. The advent of this higher, better and happier race would amply justify the long agony of its birth through the countless ages of our past. And it is the first article of my belief, some of the grounds of which I have endeavored to lay before you, that a race is in course of evolution.

ORIGINAL ARTICLES.

HYDROPHOBIA.

Read in the Section on State Medicine, at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, June 1-4, 1897.

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This paper is presented more with the idea of calling attention to enforcing the fact that there is a reliable remedy for animal poison, than to offer any new developments in regard to hydrophobia. Little that is new and undisputed has been discovered since the report of the AMERICAN MEDICAL ASSOCIATION, in 1856. We are still confronted with contradictory theories and strange anomalies, which are only to be explained from the vantage ground of one who realizes that disease is not an entity, but rather a remedial effort, and that relief comes only by our ability to recognize and assist the vital forces in their inevitable conflict with all foreign material.

Although hydrophobia is one of the rarest and most fatal of acute, infectious diseases, and is produced only by inoculation of a specific animal poison, which manifests itself by symptoms due to a disturbance of the central nervous system, it is mitigated by the more important fact that the period of incubation is longer than that of any other acute specific disease. This period is variable, rarely less than a month, in some cases reaching nine or twelve months, the average being six or seven weeks, which gives opportunity for remedial measures, that as we will endeavor to show, are ample to eradicate the poison.

The etiology of hydrophobia is so well known that it needs but a few words of description; mainly coming from the saliva of dogs, rarely from cats or other animals, it is a well recognized fact that the disease never originates in the human species. Its spontaneous origin is confined to the lower animals that do not perspire. The investigations of scientists all over the world have as yet failed to determine the true cause of this terrible malady, although the fact seems to be well settled, that the disease occurs much more frequently among the male than among the female dogs or other animals. Inoculation may arise from a bite, scratch, or from a lick upon an abrasion. Instances have been given where the disease came from the lick of a dog that was not mad.

A puzzling case occurred some years ago in England. A boy 14 years of age, while playing with a Scotch terrier, was bitten slightly on the hand. Three weeks later he became ill and died in terrible convulsions. The physicians pronounced it a genuine case of hydrophobia, but a girl who had been bitten by the same dog appeared to have suffered no harm, and, more remarkable still, the dog was examined by a competent veterinary surgeon, and pronounced perfectly healthy. Such cases are not uncommon.

When preventive measures are adopted as soon as possible, the larger number of persons escape. Children are the greatest sufferers, from being helpless and more exposed, and their cases are not open to the charge of simulated or spurious disease, and at the same time they are a complete refutation of the theory held by some authorities that there is no such disease.

The fact that during the period of incubation there are commonly no symptoms, is liable to lead to a sense of false security. But that is the time to adopt vigorous measures of prevention. Occasionally there is pain or discomfort at the seat of the wound, and sometimes mental depression, which may arise from anxiety regarding possible consequences. Even the onset of the disease is rarely attended by pain or inflammation in the wound. The first evidence of the impending disorder is usually mental depression, disturbed sleep, discomfort about the throat, with difficulty in swallowing liquids; even the attempt occasions spasms, which soon involves the muscles of respiration. The intensity of all these symptoms increase within a few hours, until the mere sight of water will cause a spasm. The reason is frequently lost, and the end from exhaustion is assured in from one to six or eight days.

The varieties in this disease are as great as in any other, because each case is modified by the condition of the system, and the vital reactive powers of the individual.

If there is a prospect of relief from the horrors of hydrophobia, this relief may well claim our earnest attention. It is well known that from the bite of a rabid dog there is a period varying from seven days to six months, before the more acute symptoms manifest themselves. This gives ample time to eliminate the poison from the system. In "Todd's Clinical Lectures," occurs this passage, "Large evacuations by sweating may be employed more freely and with less disadvantage to patients, than by any other secretion." This is also demonstrated by the fact that many diseases are daily being cured by some form of sweating bath, and that physicians are more and more using that form of treatment. In China, and other countries, as well as our own, sweating has been successfully used in the elimination of malarial poison. Another proof is that in some Eastern countries the sweating bath is used to cure the poison of snake bite, which is much more rapid in its action than the poison from the saliva from a rabid dog. It will also readily be seen that treating this malady from the outset is a very different thing from waiting until the poison has become absorbed and permeated the whole system, and the paroxysms have

set in, when in truth there is little hope of cure under any treatment.

Hydrophobia belongs to that large class designated as ferment diseases, which depend upon the introduction and development in the system of ferment germs. Enteric fever and erysipelas are familiar examples. Simple absorption has sufficed to inoculate the patient, but in the majority of instances the skin receives more or less abrasion, and the germs are either implanted in the epithelium beneath, or introduced directly into the circulation. The abrasion may heal kindly, but in a varying time, depending upon many factors, an irritation at the seat of the abrasion, accompanied with darting pains, announces the onset. Unlike other diseases, the blood appears not to be a good soil for the development of the germs, which however circulate with it until they find the soil, or tissue, best adapted to them, and then the real havoc begins. In the dog and the man, the three pairs of salivary glands, the parotid, submaxillary, and sublingual, appear to furnish the required conditions, and to be the main seat of the lesion. The congestion of the nervous centers that so directly ensue, is probably consequent upon changes in the structure of these glands. Every physician knows well how speedily severe nervous symptoms follow such changes, how intimate the sympathy is between the glandular organs of the mouth and throat and the nervous centers at the base of the brain, and what violent hysteriform seizures often ensue in such cases. With the involution of the great respiratory tract of the nervous system come difficult respiration and its train of associated symptoms. At the same time it is more than probable that the nervous system suffers from the more direct poisoning caused by the presence of germs in the circulation, but not because they are a specific nerve poison, for when a full dissection is performed, no evidence of it is found in the nerve centers, and this excludes the nerve poison hypothesis.

In the McCormick case, as reported by Dr. Hammond, June 1874, microscopic examination revealed disease of the cortical substance of the brain, disease of the medulla oblongata, and disease of the spinal cord, also disease of the pneumogastric and hypoglossal nerves. The nerve elements were broken down and oil had taken their place, and this has been found the general direction of the disease, with slight modifications in different cases. Fatty degeneration of the nerve substance was a marked symptom.

The question quickly arises, what best can be done to arrest the action of this poison? Nature does everything possible by arousing every emunctory to action and, as in all cases of poison or morbid matter in the system, the leucocytes are called upon for their most vigorous action to relieve the patient. It is claimed that immediate suction of the wound has saved many patients. Good authorities believe that the virus remains localized, for a time, in the cicatrix, and that cutting it out even after the original wound has healed, may serve to avert the disease.

To diminish the production of rabies in the dog, Fleming, one of the most distinguished veterinary surgeons, recommended that dogs should be muzzled, except in times when the disease is epidemic, that they should be placed under good hygienic conditions with a heavy tax upon every animal, and that all vagrant dogs should be killed. It is claimed by some, among them Fleming, that rabies has spontaneously originated in the dog, in consequence of exposure to extremes of heat and cold, ungratified sexual excitement, maltreatment, insufficient food, etc. Roucher, another authority, also maintained the same idea.

Opposed to this is a long array of eminent authorities who claim that rabies does not originate in the dog otherwise than by inoculation with the virus of a rabietic animal.

In the pathologic anatomy of the disease we are also involved in a mass of contradictions. Careful microscopic examinations of the brain and spinal cord, by medical experts, have been attended with entirely negative results. In some few cases there was found fatty degeneration of the nerve-cells, notably that published by Dr. Hammond in 1874, in others simple congestion of the vessels, but in the whole list there was no lesion found that was peculiar to hydrophobia.

In reporting this condition of things, the *Medical Record* stated, May 25, 1878: "We are forced to the sad conclusion that, with the present means at our command, every case of hydrophobia is necessarily fatal."

Dr. Hammond, in his report previously referred to, endorsed the plan suggested by Bourrel and also detailed by Fleming in his treatise on rabies, of having the incisor teeth blunted. So far as dogs treated that way are concerned, this was claimed to be an absolute preventive, but non-rabid dogs have been known to communicate the disease. It is a well known fact that the germs of this poison are sometimes present in the saliva of dogs that are apparently healthy, and particularly frequent in that of the spitz. It is also known that the bite of a man in anger may inoculate a man whom he bites, with poison that produces disease, if not hydrophobia. Instances are on record of a woman while in anger nursing her infant, thereby bringing on convulsions and endangering the life of the child.

The pathologic changes in the nerve substance are but the local exhibition of the general systemic poisoning. In the effort to throw off this poison a small amount of morbid matter adjacent to living structure is dissoved by the leucocytes, and is forced out of the system by way of the natural emunctories. When the system is in the throes of a vital struggle with this morbid material, there can be no excuse for thrusting upon it more of the same material, even though it be in attenuated form. The human system, when laboring under morbid influences, needs but those elements which can add vigor to the vital resistance, and the fluid which patrols the entire body, should be strengthened rather than further decomposed and disorganized by the addition of extraneous and poisonous matter.

The Pasteur treatment is the accredited method for those who have been bitten by a rabid animal, but this, like the antitoxin treatment, is simply sending one poison after another in the system, and whatever the result the victim is the chief sufferer. The Pasteur treatment has not proved uniformly successful, and in those cases where it was apparently so, it is open to question whether the patients might not have recovered without any treatment. It is well known that during the first few years of the experimental inoculations for rabies, so many deaths occurred among the patients that Pasteur himself became alarmed at his own work. Since that time, from the improvement in the treatment, the death-rate has lessened, due to the dilution of the curative lymph.

It is well enough, and most commendable, to discover the microbe which, as stated, appears "to be the veritable and sole factor in the malady," but facts go to show that the microbe is the result of the disease, except in inoculation.

Pasteur found no indication of an incubation period shorter than seven days, and he never claimed that he had discovered a *cure* for hydrophobia, but simply that a person who had been bitten by a presumably mad dog and within a few days was inoculated with attenuated virus, would not develop hydrophia; if a certain time had elapsed after the bite this preventive treatment was of no use whatever.

The London *Lancet*, of Oct. 31, 1885, says: "We can not but think that Pasteur's inferences are sanguine and premature." In the year 1895 the *Lancet* published a statement from Dr. Magner, in which he pointed out that Pasteurian statistics were very misleading, and quoted from a report of the Registrar-General of England, to show that in the five years preceding the establishment of the Pasteur Institute, the number of deaths from hydrophobia were 155, whereas in the five years thereafter they reached 159. He thought that was a strong argument that the Pasteur Institute had no effect in diminishing the deaths from hydrophobia. An article in the Paris *Journal of Medicine*, by Prof. Peter, stated that the inoculations pretended to be antirabic by M. Pasteur were in principle nonsense, and in practice deceptive. Statistics have shown that the mortality from hydrophobia, in and around Paris, the seat of the Institute, has not been in any way lowered, but on the contrary, has increased ever since Pasteur began his inoculations. In 1895, 272 persons died of hydrophobia after undergoing the Pasteurian treatment, which ought to have saved them from any attack of the malady. . . In 1866, a girl named Pauline Kiehl, was taken to the Institute, but as hydrophobia had already set in Pasteur declined having anything to do with the case. The girl was then taken to Dr. Leon Petit of Paris, who cured her by the vapor-bath treatment. . . . Dr. Lutaud, editor of the *Journal of Medicine* of Paris, with straightforwardness asserts that Pasteur does not cure hydrophobia, but he gives it. . . In 1894, Dr. C. W. Dulles of Philadelphia, made a report to the Pennsylvania Medical Society, of his special study of hydrophobia, covering a period of over ten years. His figures give an average, from a total of seventy-eight cases, of one per annum to every 4,500,000 of population, with an excess of cases in the vicinity of Pasteur Institutes. In fact, he charges directly that not only has Pasteur's methods "increased the number of deaths from hydrophobia," but that "there has been added to these a large number of deaths due to inoculation of what ought to be called Pasteur's disease." . . . Dr. Dolan, editor of the *Provincial Medical Journal*, taking a general survey of Pasteur's methods and his numerous failures, says that "Not only does Pasteur not protect from the disease under the very conditions demanded by himself, but he has added a new terror to it by the introduction of paralytic rabies."

In Long Island City, on April 25, 1897, a strange dog severely bit a 6 year old boy named Charles Silk. Two days thereafter the child was taken to the Pasteur Institute in New York and a course of treatment commenced at once, which lasted fifteen days. After completing the course at the Institute the mother of the child was told that her son was insured against dog bites for ten years to come, but three weeks from the day of being bitten, the boy died, a pronounced case of hydrophobia.

Better than Pasteur institutes, and better than all other remedies, or rather preventives, would be what is proposed by an eminent English writer, Mrs. Maynell, in the London *Chronicle* and that is the utter extinction of the canine race, holding that the life of one child is of more value to the world than that of all dogs, and that one of the inevitable results of our advancing civilization will be their extinction. While the dog forms a prominent feature of the domestic life of our day, the services he renders are by no means an adequate offset to the danger with which his presence continually menances the community.

The Pasteurian treatment is a grevious mistake, although it is as yet the only method that has medical sanction. There is a simpler, safer and more scientific treatment for the dreaded disease, based not upon the old fashioned practice of putting foreign matter into the system, but on the more modern and exact principle of eliminating the poisonous taint. That is the hot air or vapor bath treatment as practiced in many lands, but particularly by Dr. Buisson, formerly of Paris. By this means patients have been cured, even after hydrophobia had set in.

In the year 1826, Dr. Buisson was called in to attend a woman attacked by hydrophobia. According to custom he bled her, and happened to wipe his hands on her handkerchief, covered with saliva. "Perceiving a mark on the first finger of my left hand," he writes in a book published in Paris in 1855, "I became aware too late, how imprudent I had been. As soon as I reached home, I cauterized the wound with nitrate of silver. On the seventh day I experienced a sharp pain in the region of the scar. Imagining, however, that it was in consequence of the cauterization, I paid no great heed to it, but the pain became so intense that I was obliged to put my arm in a sling. The pain grew more and more acute, commencing at the first finger and following the radial nerve till it mounted to the forearm. The paroxysms lasted two or three minutes, with intermissions of five or six minutes. At each paroxysm the pain spread to the length of several centimeters, when it passed the elbow it became intolerable. My eyes were extremely irritable, and felt as though likely to start out of their sockets. I was painfully affected by light, and consequently by all luminous bodies, such as glass and metals. My hair seemed to stand erect. My body seemed lighter than air; I believed that by springing from the ground I could have lifted myself up to a prodigious height. I had tightening of the throat, constant nausea, salivated much, and expectorated incessantly. I felt that my sublingual glands were swollen, but when I wished to assure myself of the fact by looking at them in a glass I was unable to carry out my design on account of my eyes. I had a constant longing to run and to bite, and my only alleviation was to walk quickly up and down my room, biting my handkerchief the while. I had a horror of water."

Ordinarily there is but one result to such a condition as this. "For some time past," continues Dr. Buisson, "I had been persuaded that a vapor bath was able to prevent, but not to cure hydrophobia. My thoughts being occupied solely with death, I sought that which was the most prompt and least painful, to put an end to my life. I resolved to die in a vapor-bath. I took a thermometer in my hands, fearing

that the heat I desired might be refused me. I had been but a few minutes in the bath before I felt a change for the better. This gave me hope. At 127 degrees F. I was cured. At first I believed it was merely a long intermission from pain, which would be terminated by contact with the air outside the bath. After the bath I dined and drank with ease, and went to bed and slept well. From that day to this, nearly twenty years, I have felt no sort of pain or uneasiness."

Dr. Buisson again says: "Experience has proved to me that hydrophobia may last three days. The cure is sure by following my system the first day, uncertain the second, impossible the third. Who would wait for the last day, knowing my means? One would not even wait for the malady, one would always prevent it. Hydrophobia never shows itself before the seventh day after the bite, and one can then go a long journey to procure these baths, called Russian."

The *Lancet* says: "Hydrophobia was cured by the late Dr. Buisson in his own and eighty cases by vapor baths, raised rapidly to 135 degrees F., and more slowly to 145 degrees F." "A vapor bath," writes Dr. Buisson, "prevents the development of hydrophobia and cures the malady when developed. In order to convince all sensible persons that I am really in earnest I offer to inoculate myself with the disease. This fact should be a sufficient guarantee of the certainty of my method of cure."

It is interesting to state that in London there is now established a Buisson institute, under the care of a qualified physician, for the gratuitous treatment of hydrophobic cases. A number of cases of undoubted hydrophobia have been successfully treated by means of these baths in India, and the Viceroy of India has notified Mr. F. E. Pirkis, R. N., of the London Buisson Baths, that the government will afford facilities for the placing of Buisson baths for the treatment of hydrophobia, in government hospitals and dispensaries in India. Twenty baths for that purpose are being immediately dispatched. In looking over a late paper from Calcutta, it was noticed to contain an advertisement of thirty-four Buisson Baths, located in different parts of India, where that treatment could be obtained free by needy sufferers.

There is no possible doubt as to the value of the Turkish bath in all disorders of the ferment class, and whether it is competent to the complete eradication of the poison, or to arrest destructive tissue changes when once they have thoroughly begun, will appear doubtful only to those who are not familiar with the wonderful restorative action of heat when used in its higher potency. The simple treatment of a hot air bath has actually cured the disease in the last stages and restored the patient when in the extreme horrors of rapidly approaching death. A prompt use of the hot-air bath in every case of a bite from a dog can not but do good, even if there is no question of the animal being rabid, and when the animal is mad it is a safe and effective remedy. Whoever is willing to investigate the merits of the hot-air bath will soon learn that it has a valid claim to the title of certain cure for hydrophobia.

In Brooklyn, N. Y., June, 1874, a case came under my supervision. A suspected dog was confined but broke away and in his career of biting other dogs also bit a Prospect Park laborer, one George Wagner. As the dog was to all appearances suffering from rabies he was immediately killed. The man's wounds were cauterized with nitrate of silver and on the third day thereafter he was brought to the Turkish bath. He was bitten through the palm of one hand and partly through two fingers. He complained of what seemed like neuralgic pains in the hand and arm, which were swollen, and also pains in the head, back and throat. He underwent the processes of the bath twice daily during one week and once daily for two weeks longer. The baths were administered with exceptional vigor in his case. Soon every unpleasent symptom vanished and for many years afterward he was well and hard at work.

Dr. M. Hermance, also of Brooklyn, N. Y., in 1877 saved a boy from the agonizing death of hydrophobia, by the use of the vapor bath, which was applied while the patient was tied down in bed. In about three-quarters of an hour after beginning operations a profuse perspiration was induced. When he began to sweat freely signs of returning consciousness appeared, which increased as the perspiration was continued, until in the space of about two and a half hours he was fully restored to consciousness, with a perfect relief from all his hydrophobic symptoms, the pain in the bitten hand and arm included, of which he had complained very much in the intervals of consciousness between his convulsions.

There is also most positive evidence regarding this form of treatment from Wilmington, Del. In the year 1869 three children of that place were bitten by a rabid dog. This dog also bit a heifer, a cow and two other dogs. The four animals soon afterward died of hydrophobia. The children were placed under the care of Dr. John Cameron of that city and by him were taken to Philadelphia and there subjected to the Turkish bath daily for two weeks. Although the wounds were very severe and the discharge from one of them was of the color of verdigris for several days, they healed without difficulty and no symptom of the malady has been manifested since.

In 1866 Rev. J. J. Curran of the Industrial School, Arlington, N. J., published a case which occurred under his care. One of the pupils named Klee was bitten on the hand by a dog on January 2. As the wound healed rapidly nothing more was thought of it, but on January 22 unmistakable symptoms of hydrophobia manifested themselves and increased for two days, when there appeared no possible hope for him. Then a small kerosene oil stove was lighted and placed on the floor; on top of this was placed a pan of boiling water and over all a chair, on which the boy was seated. Around the chair and boy and vapor-making machine were wrapped several folds of blankets, pinned about his neck and fitted so that the steam was retained about his body. He was also given a dose of sweating medicine and in five minutes the perspiration was streaming from every pore of his body and in ten minutes after he said: "The pains are all gone!" He was kept in this condition for about half an hour. The result was that the boy was cured and two months after he was as well as he ever had been and so continued.

The natives of Australia, and also of India, have a successful habit of at once taking violent exercise on beginning to feel ill. This is the principle of the Turkish bath treatment, that is, to relieve the system of its impurities by sweating.

Sir John Drummond Hay, who was many years English minister in Morocco, long before Pasteur's time, stated that the Arabs there cured hydrophobia

by sweating. The patient was swathed in woolen covering till all but smothered, placed in a small tent (these tents are always of black camel's hair, much more impervious than canvas) and then the tent was closed so as to exclude air as much as possible and the patient left until profuse perspiration carried off the poison. This treatment was found invariably successful.

A St. Petersburg newspaper states: "We are informed by good physicians that if the patient, immediately after being bitten, will go into a bath and stay there seven days he will have excellent chances of recovery. The poison in the blood will be eliminated by a steady and vigorous perspiration. Some physicians have attained good results by washing the wound with warm vinegar and then applying hydrochloric or muriatic acid."

There is undoubtedly an hysteric or "mental hydrophobia," as it is sometimes called, induced by emotion, or through fear of the disease after having been bitten, which may lack many of the characteristic symptoms of the true affection and differs from it notably in its rare fatality. Such cases, serious enough to the patient for the time being, would be most easily and agreeably treated by the Turkish bath. Herein would come one of the great advantages to the community, which every city would enjoy by having, what would be most desirable to all, a public Turkish bath, that would be open to such cases as well as to any other. A few days' or, at most, a few weeks' treatment at such an establishment would put the patient out of reach of any danger from hydrophobia.

Some twelve years ago, four children, living at Newark, N. J., were bitten by a dog supposed to be rabid, and more than $1,000 was subscribed to send them to Paris that they might undergo Pasteur's treatment. If the people were only awake to their best good and would subscribe liberally for public Turkish baths they would have a better and surer remedy right at their own doors.

On March 28, 1897, Dr. Frank D. Gray, in Jersey City, was bitten by a St. Bernard dog that had shown some slight symptoms of rabies. Evidently not knowing any better way, Dr. Gray sailed for Paris to take the Pasteur treatment. Had he been aware of the eliminating power and healing virtues of the Turkish bath he could have remained at home and saved himself the mental torture as well as the expense incident thereto. It is very pleasant and desirable to go to Paris, but to "wash and be clean," is much more desirable.

The conclusion that is forced upon us by these facts is that in all cases of infectious disease our chief efforts should be directed to promoting the eliminating power of the patient. This is working in harmony with and assisting the vital resistance to disease. Whatever tends to invigorate the individual enables him the more quickly and surely to surmount the difficulty. Herein lies the most important element. When it is understood that in the proper application of heat, and in that we recognize all forms, whether it be the use of hot water, the Russian bath or the above all most desirable Turkish bath, and the fact remains that in heat we have an agent capable of counteracting the poison of rabies, then it may well be asked, What poisonous influence can resist its potency? Knowing this we should do all in our power to arouse the the public mind to the value of the public Turkish bath, which should be established by the people in every city in the land and so conducted that its blessings would ramify through every stratum of society. Thus would we hasten on the time when hydrophobia will cease to be a terror in the land and disease will not be the inheritance of every child, but rather that good health will be the pride and possession of every citizen.

A STUDY OF THE BLOOD IN TUBERCULOSIS.

OR THE RELATION OF LEUCOCYTES TO THE BODY AND THEIR AID IN INTERPRETING VITAL PHENOMENA.

Presented to the Section on State Medicine, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

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No branch of science appeals to us so deeply as the study of life; and it is the object of the following research to investigate some of the causes which tend to shorten life, and if possible to devise means of detecting these causes before they have produced permanent injury to the individual.

In presenting the subject I feel very keenly my inability to do it the justice which it deserves. But realizing that success is achieved in any line of research only after repeated efforts, and often after many failures, I am encouraged in the undertaking, believing that the closer we adhere to nature, the nearer we shall arrive at the truth. Also I regret that the limited time which is necessarily allowed for the presentation of the subject, prevents my giving proper credit to many authorities whose researches have rendered me valuable assistance in forming the following deductions.

A Preliminary study.—The animal organism has been the subject of study and discussion as long as any now before the scientific world. Previous to the time when the microscope came into use, vital phenomena were very imperfectly understood. But since that date much progress has been made.

A study of the living organism may be made with reference to its structure or morphology, or with reference to its functions. In former papers,[1] dealing with the blood in tuberculosis, I have considered almost exclusively the morphology of cells and their physiologic chemistry. In these departments I have pointed out numerous analogies existing between leucocytes and the larger organism. But the present paper will be more in the line of

A study in functions.—I shall attempt to point out, interpret and classify the phenomena of cell life, and to ascertain if analogies cease with the morphology, or if they are also extended to the functions.

1. In studying the functions of a living organism, I shall begin with the simplest form of animal life, the leucocyte. I shall first note cell phenomena, and then interpret and classify them, with reference to ascertaining how far they reveal the conduct or behavior of the cell, or the plan or purpose of its actions. With this in view, a small quantity of fresh blood or lymph is prepared in the form of a hanging drop.

Among the first phenomena noted are those pertaining to cell metabolism. Cells are observed to partake

[1] Medical Record, Sept. 5, 1896; March 13, 1897.

of food, grow, develop to maturity and finally die, or divide and form two new cells. Furthermore, if an artificial stimulus is applied, they contract and move away; or, in other words, they make an effort to avoid the irritant. If pathogenic germs are introduced into the hanging drop, the cells approach the invaders, and often an immediate warfare ensues. If a single cell is observed, and the enemy is too powerful for a single-handed combat, the cell moves away and in a short time a group of cells appears and joins in the attack. These interesting cell phenomena have been observed and reported by Metschnikoff, Leidy, M. Greenwood, Kanthack and many other excellent authorities.

Hence, a study of cell phenomena is evidence that cells experience sensations; that they respond to irritation; that they possess the power of adjusting their actions with reference to the conditions surrounding them. In other words, they feel the need of food or experience hunger; they make a struggle to obtain food, which is a struggle for existence; they recognize the presence of an enemy, and exert themselves in self-defense or self-preservation; they manifest the disposition to protect their companions against enemies; and by development they reveal the phenomena of differentiation of functions and structure, and show a tendency to put into execution the principles of co-operation and division of labor; and finally, they reveal the phenomena of reproduction.

If leucocytes exhibit such remarkable and independent behavior when extracted from the larger organism, and are independent of its central nervous system, it is evidence that the actions or conduct of each cell emanate from within the cell itself. Hence, each cell is endowed with a something which produces vital phenomena.

2. The larger animal organism is an aggregation of cells, or smaller living organisms. These cells become classified into groups by the process of differentiation, and each group is especially employed in performing some particular function. Now, since it is observed that the cell is endowed with that which produces vital phenomena, it seems rational to infer that the vital phenomena of the larger organism is the aggregate of the phenomena produced by these smaller organisms or cells.

3. Finally, the social body, or the body politic, possesses the characteristics of a complex organism. Men divide themselves into groups and classes, each from repeated effort acquiring skill sufficient to perform some particular function; each, in some respect, differing from the others, and yet all co-operating for the good of the whole.

Classification of organisms.—Thus, we find three distinct realms of life, each being a part of a larger realm. The cell is a living organism on a low plane of development; it is a vital unit and occupies the first biologic magnitude. Man is a complex organism on a higher plane of development; he is a multiple of units and occupies the second magnitude. Humanity is a more complex organism, a compound multiple of units, and occupies the third magnitude. On the other hand, we find in the cell a localized center in the nucleus; in the individual, a localized center in the brain; while in the social organism we find a centralization of functions in the seat of government. Furthermore, there is an environment or realm for each of these organisms: for the cell, for man and for humanity.

It is not our purpose in this research to enter into a discussion of psychic problems. But a study of life in its various realms is evidence that there is within every living organism a something which enables it to adjust itself to its environment. And in bringing about this adjustment, vital phenomena result from acts emanating from within the organism itself. Hence, the laws by which these acts are governed are the laws of the organism. The laws by which cells and their phenomena are governed are the laws of biology. The laws by which individuals and their conduct are governed are the laws of sociology; but from the many analogies existing between these smaller and larger organisms, it would seem that the laws of sociology are simply the laws of biology extended to a wider realm.

System of interpretation.—In former papers I have outlined, in part, the fundamental principles of a system of interpreting vital phenomena. This system is based upon what I believe to be rational hypotheses. These may be formulated as follows:

1. That there is a system of life realms, each realm being a part of a larger realm.

2. That there is a continuity and universality of the laws of life.

3. That the laws in force in the various life realms run in parallels and are analogous.

4. That the phenomena in each realm have analogues in each of the other realms.

5. That a study of the laws and phenomena in one realm will lead to the discovery and interpretation of their analogues when we enter other realms.

Therefore, resting upon these hypotheses, a study of the larger and more complex body will furnish a key for interpreting the laws and phenomena of leucocytes. And, inversely, cell phenomena will give us a key to the larger body.

Factors in organic development.—Now, since every living organism, consciously or unconsciously, tends to adjust itself to its environment, in bringing about this adjustment, there is a change or differentiation in its functions; and, as a result of differentiation in its function, there follows a corresponding differentiation in its structure or morphology. Hence, during the course of the natural development of an organism, as it readjusts itself to a constantly changing environment, there follows both a physiologic and morphologic differentiation. This is true of a cell, an individual or a nation. Therefore, there are three important factors to be considered in the study of organic development: 1, the condition surrounding the organism, or its environment; 2, its functions; 3, its structure or morphology.

The law of differentiation.—Further, when such interesting cell phenomena are observed in a hanging drop, after the cells are removed and have no further connection with the larger body, we may ask what may be expected of such cells if they become differentiated into tissue cells and become a part of the organized body? The problem is difficult of solution. But if we may utilize the phenomena observed in one realm of life to interpret those observed in other realms, we may infer from observing the result of evolutionary development in larger organisms, that when a cell undergoes differentiation its former functions are not lost but, on the contrary, strengthened, developed and differentiated.

In this connection, we may ask what becomes of the infant when it attains adult life? After attaining

a certain degree of functional development it takes a place in the social organism and, after acquiring sufficient skill, performs a part of the complicated labor of humanity. If it is a strong organism its functions will be equally strong, or if a weak organism the functions will be equally weak, and the social body will be strengthened or weakened accordingly.

Hence, it would seem that in a similar manner, when a wandering cell or leucocyte becomes a tissue cell, that it will continue to be a center for the exercise of its inherent functions, in a similar manner to that before becoming differentiated; but that it will take upon itself more complicated duties. If it is a strong cell its functions will be equally strong, or if a weak cell they will be equally weak, and the larger organism will be affected accordingly.

Hence, acting upon the assumption that there are definite relations existing between morphology and functions, and between functions and environment, and that these relations are governed by laws, I began the study of tuberculous blood, believing that I might find morphologic appearances in the blood elements characteristic of this disease.

Etiology.—The etiology of tuberculosis has been involved in uncertainty. This much, however, is now generally accepted: that it is produced by the tubercle bacillus. Some authorities claim that bacilli are the sole factors in bringing about the disease. From a somewhat extensive study of the blood in this disease, I feel justified in stating that if we stop at this point only a part of the truth is expressed. These studies have convinced me that it is not only necessary for bacilli to enter the animal body, but that they must find the necessary conditions for propagation before the diseased condition known as tuberculosis becomes established. In this connection it is a well recognized fact that tuberculosis is associated not with strong tissues, but with tissues that are more or less weakened. Therefore, one object of this paper is to show, from a study of the blood, that there must be a previous condition of diminished resisting power of the tissues which renders them a fertile culture medium for the pathogenic germs, before the germs begin to develop; or, in other words, that tuberculosis is preceded by a pretuberculous stage, which in reality is as much a stage of the disease as the ovum represents a stage in the life history of the future organism. In the first instance, if the body tissues furnish a fertile culture medium for the bacteria, as soon as they enter the tissues germ genesis begins and a germ colonization becomes established. In the second instance, if the ovum furnishes a fertile culture medium for the sperm, as soon as the sperm enters it cell genesis begins and a cell colonization becomes established. The first colonization, if not checked in its progress, ultimately develops into an active tuberculous condition; the second colonization, if not checked in its progress, ultimately develops into a more or less mature organism.

Therefore, in searching for the source of the disease, we must antedate the beginning of active germ development in the weakened tissues by passing back to the time when the tissues begin to lose their resisting power and thereby become a fertile soil for the germs. The question which appeals to us most forcibly at this juncture is: Can the condition of feeble resistance of the tissues be detected before the bacilli form a colony and the tissues begin to disintegrate?

Factors in culture development.—A further argument on this line is one which every bacteriologist knows to be true, *i.e.*, that before he can grow a culture, three things are absolutely necessary: 1, a culture medium more or less congenial to the growth of bacteria; 2, living germs; 3, conditions of temperature, moisture, light and atmospheric pressure surrounding the culture medium, favorable to growth. An artificial culture medium may be as perfect as can be prepared, yet if it be kept at a boiling or freezing point the culture will not develop. Therefore, with a congenial culture medium and living bacteria, unless the surrounding conditions are favorable, there will be no culture formation. Many competent observers have reported experiments which show that bacilli may remain inactive in an uncongenial culture medium and yet retain life; but when the conditions become favorable to development they immediately begin to multiply. Whether we consider artificially prepared culture media, or the tissues and fluids of the animal organism, these facts are equally true.

This theory, therefore, furnishes a rational explanation for the unequal susceptibility of various persons to tuberculosis. And this explanation rests upon the hypothesis that tubercle bacilli gain admittance to the tissues of the animal body more readily, and propagate more vigorously, when the tissues are in a definite or specific pathologic state.

The relation of leucocytes to the body.—This brings us to the most important part of our subject, viz.: The relation which leucocytes bear to the larger tissues of the body, and their aid in revealing the condition of these tissues which renders them a congenial culture medium for bacilli.

It matters little in this study which theory of cell genesis is accepted, viz.: That leucocytes are tissue formers, or that tissue cells are leucocyte formers. In either case cell genesis results from cell division, and by the process of development and differentiation there is a transformation from one state through a series of changes into another state. Hence, it matters little in which direction the cell differentiation takes place; whether it takes place from leucocytes toward tissue cell; from tissue cells toward leucocytes, or whether it takes place in both directions. In either case a reciprocal relation exists between the proximate and remote state of the cell as well as between the parent cell and its offspring. Therefore, it is the intention of this study to show that it is possible, from a study of the leucocytes, to make a diagnosis of approaching active tuberculosis before the larger tissues of the body show evidence of breaking down.

The basis for diagnosis.—If we accept the theory that leucocytes are tissue formers then it is evident that if they are deteriorating before they become differentiated into tissue cells, that the tissues themselves will eventually possess the same characteristics; or on the other hand, if we accept the theory that tissue cells are leucocyte formers, it is also evident that if the tissue cells are weak and manifest a tendency to disintegrate, that the leucocytes will possess the same characteristics. Consequently, in either case, in estimating the resisting power of the larger tissues we must ultimately depend upon the leucocytes. Therefore, it is upon the following hypothesis that a diagnosis is formed: That disintegrating leucocytes form, or are formed by, weak tissues and weak tissues furnish a congenial soil for the development of bacilli.

Blood changes.—A careful study of the blood

reveals comparatively uniform sets of phenomena for health and for each variation in the body tissues. Hence, the relation between the blood elements and the body tissues becomes an important factor when we seek to discover the beginning of pathologic processes. The blood changes which take place during the progress of diseases are exceedingly numerous. The ability to correctly interpret all cell phenomena, many of which are now looked upon without conveying any significance, would no doubt be the means of explaining what are considered obscure conditions.

It will be generally conceded that immunity, idiosyncrasy and predisposition are terms used for processes or conditions of the living organism concerning which we possess very little knowledge. And until we possess a better knowledge of cell phenomena many of the phenomena of the larger organism will no doubt remain in obscurity.

Blood changes in tuberculosis.—On comparing the phenomena of the blood elements in various diseases with those of normal blood many differences become apparent. Hence, a definite combination of these differences is frequently recognized as being significant of a definite pathologic condition. In study of the blood in tuberculosis I have recognized numerous cell phenomena which have invariably existed, to a greater or less degree, according to the progress which the diseases has made. I have interpreted these phenomena as signifying:

A. Irregular cell genesis and, B., irregular cell metabolism. These differences may be recognized, *a*, from variations in the morphologic structure of the cells, and *b*, from variations in the staining properties of the cell tissues.

A. Irregular cell genesis may be subdivided into: *a*, Defective cell production, and *b*, excessive cell production.

B. Irregular cell metabolism may be sudivided into: *a*, Irregular cell differentiation, and *b*, excessive cell disintegration.

Irregular cell differentiation may be subdivided into: *a*, Defective cell development; *b*, perverted cell development, and *c*, excessive cell development.

A few of the forms and characteristics of irregular cell differentiation are the following: 1, Giant cells; 2, dwarf cells; 3, cells with poorly differentiated nuclei; 4, cell bodies having poverty in granules. These and many others are probably the phenomena of cells of low vitality. In this connection I have particularly observed that cells of low vitality usually possess feeble differentiating power, and this is shown by their nuclei.

Cell disintegration.—It is but one step from malassimilation to disintegration. This is true of the larger organism and equally true of the cell. Cells of low vitality are probably first to undergo disintegration and disintegration usually begins during the early life of the cell and may be partial or complete. In this connection it is well known that the risks to life in larger organisms are much greater in infancy and early childhood. The same is evidently true in cell life. Hence, when the products of cell disintegration are abundant it indicates a feeble organization of cell tissues. and when this exists we may expect weak body tissues and hence weak organism.

Cell genesis.—It is a question as to whether there is a disease due to defective cell genesis, since reproduction is one of the strongest functions of an organism. On the other hand, excessive cell genesis is associated with many pathologic conditions.

Leucocytosis.—Leucocytosis is generally believed to result from excessive cell production. But it must be remembered that there are other factors by which leucocytosis is governed. In discussing this subject we must consider the manner in which cells are disposed of as well as their genesis. If we accept the theory that leucocytes are tissue formers, then, when a leucocyte becomes differentiated into a tissue cell, either in the process of tissue growth or in the process of tissue repair, the cell is evidently no longer in the circulation. Therefore, if this occurs a leucocyte is disposed of. On the other hand, a leucocyte may from feeble structure undergo disintegration before it become transformed into a tissue cell. In this case it is also disposed of. Hence, leucocytes may disappear from the circulation by being differentiated into tissue cells and taking upon themselves the functions of organized cells or by passing into dissolution before this is accomplished.

Furthermore, if cell genesis should be normal and from some cause the combined number of leucocytes undergoing differentiation into tissue cells and those undergoing disintegration while yet in the circulation are not equal to the number generated, an increase in the number of leucocytes existing in the circulation will evidently follow, and this is known as leucocytosis. We therefore see that theoretically it is possible to have leucocytosis without excessive cell production.

On the other hand, if the number of cells that become differentiated into tissue cells, together with those that undergo dissolution while in the circulation, are equal to the number generated, even if the number generated be in excess of normal cell genesis, yet there will be no increase in the number of leucocytes remaining in the circulation and consequently we will not have leucocytosis. We therefore see that theoretically it is impossible to have excessive cell production without having leucocytosis. Hence, the degree of leucocytosis is not so important as the other cell phenomena which accompany it, which assist in estimating the degree of cell disintegration and the differentiating power of the cells. But, when leucocytosis exists in tuberculosis we may look for one of the advanced forms of the disease, namely: *a*, Chronic suppuration; *b*, formation of lung cavity; *c*, inflammatory exudation.

Diagnosis by exclusion.—While it is true that there are a number of cell phenomena, such as poorly differentiated nuclei, leucocytosis, a marked change in the differential percentages, and many other conditions, which are present to a greater or less degree in a variety of diseased conditions, yet there are usually accompanying symptoms, or the absence of certain symptoms, which will enable one familiar with blood appearances in health and disease to make a diagnosis by the method of exclusion. Hence cell phenomena may be considered both as positive and negative evidence in forming a diagnosis, and often the negative evidence is as valuable as the positive.

Stages of tuberculosis.—In order to facilitate the study of tuberculosis I have made the following classification of the stages, and given the blood characteristics for each:

1. *The pretuberculous stage*, approaching closely to incipiency. No leucocytosis; a slight decrease in the percentage of young cells; very little or no rela-

tive increase in the percentage of phagocytes; cells of feeble differentiating power; more or less abundant debris from cell disintegration.

2. *Early incipiency*, or the stage in which the tuberculous process has not yet become general, and before there is active disintegration of the larger tissues. No, or very little, leucocytosis; moderate decrease in percentage of young cells, which decreases as the disease advances; moderate increase in percentage of phagocytes, which increases as the disease advances; accompanied by well marked evidence of cell disintegration and impaired cell differentiation.

3. *The advanced stage*, or the stage in which the disease has advanced to destructive tissue changes, *e. g.*, when there is formation of lung cavity and extensive distribution of the tuberculous infection. Slight leucocytosis; marked relative decrease in the percentage of young cells; marked relative increase in the percentage of phagocytes; abundant evidences of cell disintegration; abundant debris from cells that are going, or have already gone, into dissolution, and imperfect cell differentiation.

The fact that in tuberculosis there is more or less decrease in the percentage of young cells in the blood does not necessarily argue that there is deficient cell genesis. The explanation probably lies in the fact that cell disintegration is abundant in these cases, and that cell mortality is greatest among young cells.

At this point I wish to give a brief interpretation of the

Significance of phagocytosis.—When bacilli find the larger tissues of the body in a suitable condition for colonization, they at once begin to multiply. The first evidence, or at least one of the first evidences gained from a study of the blood, indicating that the bacilli have commenced active colonization, is a relative increase in the percentage of phagocytes, which I shall express by the term *phagocytosis*.

In using this term I do not wish to convey the meaning which is often attached to it, which relates to the function of phagocytes, but, on the other hand, I wish to express the condition of a relative increase of the number of phagocytes as compared with the other varieties of the leucocytes; in a similar manner that leucocytosis is used to signify a relative increase of the number of leucocytes as compared with the number of red cells.

One of the first principles of every organism is self-protection. Therefore, whenever there is an active colonization of bacilli in the body, we invariably find an increase in the relative percentage of phagocytes. The natural inference is that the phagocytes are interested in the defense of the organism. If bacilli are toxin producers, their toxins begin to accumulate in the body when they begin to multiply; and, on the other hand, when the toxins begin to accumulate in the body, there is invariably a marked relative increase in the percentage of phagocytes, and this consequently justifies the theory that phagocytes are antitoxin producers. Hence, when a marked phagocytosis exists, it would seem to indicate that nature was making a greater call for the antitoxins. Therefore, when there is an increase in the bacilli and their toxins in the body, the organism in self-defense calls for increase in the antitoxins; and when this occurs we invariably find a phagocytosis and often a leucocytosis.

In further proof of this interpretation, I have observed

The effects of treatment.—I have invariably found that an improvement under any treatment in tuberculosis is accompanied by:

1. A relative increase in the percentage of young cells in the blood, which usually has decreased in proportion to the severity of the case.

2. A decrease in the phagocytosis, which exists almost always in proportion to the severity of the case.

We observe, therefore, that under a successful treatment for tuberculosis one of the effects is a decrease in the phagocytosis. And if phagocytes are recognized as antitoxin producers, we have no alternation except to infer that there is a decrease in the demand for antitoxins, and this further signifies that the supply of toxins has been diminished. Furthermore, if toxins are the product of the bacilli, this directly implies that the germs are decreasing and hence the patient is improving.

Within the limits of a single paper one can do little more than generalize on many of the important points which aid in forming a diagnosis and differentiating the pathologic conditions revealed by means of the blood. The foregoing interpretations have been made and verified by actual experience in the study of many hundred cases of tuberculosis, both in the progress of the disease and during convalescence, under various methods of treatment.

But notwithstanding this they are not intended as dogmatic statements. They, however, express my conviction that if blood phenomena are properly studied and correctly interpreted, they will enable us to approximate very closely the true state of the living organism, at a time when a diagnosis is most valuable.

Staining methods.—One of the most important steps in the study of pathologic blood, is the necessity of being familiar with the staining methods that bring out cell phenomena which are significant in disease. I have found it exceedingly difficult to combine the ingredients of staining solutions in such a manner as to bring out perfectly the phenomena belonging to all parts of the blood, in the same specimen. I therefore have found by experimentation that it is of great assistance to stain two or more films of the same blood according to the methods which bring out various sets of cell phenomena to the best advantage. By studying these in connection with each other I ascertained that each furnished information not found in the others. While making these staining experiments, I accidentally discovered that many varieties of staining could be produced upon the same blood film. By this method various portions of the film reveal a distinct set of cell phenomena, and by it much labor is saved.

The method which I have adopted is as follows:

TECHNIQUE OF QUADRANT STAINING.

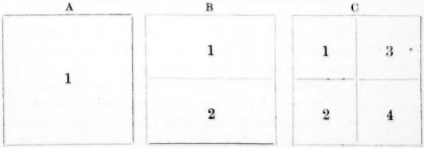

Fig. A.—1, unstained film. Fig. B.—1, unstained: 2, stained in acid stain. Fig. C.—1, unstained; 2, stained in acid stain; 3, stained in basic stain; 4, stained in acid stain and counterstained in basic stain.

After properly fixing the film, the cover-glass is grasped by the upper margin with a pair of forceps

and a portion of the film lowered into an acid staining solution. It is allowed to remain in this solution a sufficient length of time to properly stain the oxyphile tissues. It is then removed from the staining solution, washed in a normal salt solution and dried between the folds of blotting paper. It is then quickly passed through a flame, with film surface uppermost, care being used to avoid overheating (Fig. B).

The cover-glass is next grasped by its left-hand margin with a pair of forceps and a portion of the film lowered into a basic staining solution. It is allowed to remain in this solution a sufficient length of time to produce proper counterstaining. It is then removed from the solution, washed and dried (Fig. C).

It is now observed that each quadrant represents a distinct set of cell phenomena and that each can be studied separately without readjusting the microscope.

First quadrant: Shows the blood in an unstained condition.

Second quadrant: Stained only with an acid stain, hence shows all oxyphile tissues.

Third quadrant: Stained only with a basic stain, hence shows all basophile tissues.

Fourth quadrant: Stained with an acid stain and counterstained with a basic stain, hence shows oxyphile, basophile and amphiphile tissues.

The claim has been made that the limits of hematology have been reached; but the more one studies the profoundly interesting phenomena observed in the blood, the more he is convinced that hematology has but commenced to reveal the truths that are possible of discovery. Why one familiar with blood work can refuse to believe the truths that are contained within the blood elements is difficult to understand. Fortunately a refusal to recognize such phenomena will not invalidate the truths which they portray.

It is quite probable that unsatisfactory blood work and the apparent lack of uniformity in the same way result from the following: 1, an imperfect or irregular technique; 2, unfamiliarity with cell tissues, and especially the phenomena of cell disintegration; and 3, absence of a systematic method of interpreting, classifying and recording phenomena.

In conclusion. When we realize that the bacillus is not the sole factor in the cause of tuberculosis; when we realize that there must be a condition of weakened resistance on the part of the tissues before the bacilli can find a congenial culture medium in which to develop, we shall have taken a long step in the right direction in the study of the disease. Also, when we realize the relation existing between leucocytes and their antitoxins on the one hand, and pathogenic organisms and their toxins on the other, we shall have advanced far toward the solution of the problem of immunity and shall have done much toward establishing the *modus operandi* of pathologic processes.

Therefore, instead of hunting for the germ of the disease, let us also search for the condition of the tissues which is known to favor its development. Instead of attempting to destroy the germ, let us also attempt to improve the condition of the body tissues and thereby render them less congenial to the germs. And if we wish to successfully accomplish this we must detect the pathologic process early in its progress, Hence, an early diagnosis made through a study of the blood element is our hope of detecting the condition of the larger tissues before they have commenced to undergo active disintegration. And if detected at this stage, proper steps may often be taken to prevent the further advance of the disease. But when the condition of the tissues is discovered which furnishes a fertile soil for the growth of bacilli, the most persistent treatment should be instituted, accompanied by an early change to a climate known to be less favorable to germ development.

205 Jackson Block.

THE ADVANTAGES OF CASTRATION IN THE DEFECTIVE.

Presented to the Section on State Medicine, at the Forty eighth Annual Meeting of the American Medical Association held at Philadelphia, Pa., June 1-4, 1897.

BY EVERETT FLOOD, M.D.

BALDWINSVILLE, MASS.

The conclusions presented are drawn from observation of twenty-six cases. None of the operations have been reported unless more than one year has elapsed and nearly all are more than 2 years old while a good number are from 3 to 8 years old.

The ages of the boys vary, but are nearly all between 7 and 15 years. It is very easy for the critic to claim narrowness of view in any one advocating such an operation as this and to offer the usual objections of tradition, but it is not so easy for him to offer us any measure giving equal relief. This is not presented as a panacea but simply for what it is worth and it is not a premature chance thought. The first castrations were performed with the idea of preventing masturbation in certain cases where the habit was most constant and the boy had no sense of shame, besides being a confirmed epileptic and of course somewhat feebleminded.

The written consent of the parents or guardian has been obtained in each case and the operation has been in many instances performed by a surgeon of the staff, but in others by the resident officers.

It has been found in every case that the masturbation has ceased, the boy has become fairer in complexion, and in a few instances has taken on additional flesh. He has ceased to have foul thoughts and to give expression to lasciviousness, and no longer entices other boys to masturbate in his company as was often done before the emasculation. They have all become more manageable, less inclined to quarrel, more capable of reasoning.

The number of spasms has diminished in every instance, though in some cases but little, and the force and frequency of the attacks have been lessened. The mental effect on the boy is always good. If he considers it all he looks upon himself as a specially favored being and a grade higher in the scale than the ordinary boy. No melancholia has so far followed the operation. The boys have become tidier in their manner of dress and in personal cleanliness. More confidence is reposed in them by their associates, truthfulness has increased, parents feel safer about them. The possibility of their transmitting defects to offspring is of course removed.

In some instances no particular benefit has been noticed, except the cessation of the habit, for a long time, one or two or more years; then the boy has begun to gain and has shown steady improvement in intellect as well as in a much reduced number of spasms. Many of these cases have had all treatment stopped

after the operation, and naturally some months have elapsed before they were in the usual condition of physical health. This is especially the case where the bromid habit has been broken up in conjunction with the castration, or a short time subsequent to it. The question as to whether resection of the cord would be followed by advantages equal to those coming after the removal of the glands has not been investigated.

The effect on girls has been noted in only two cases. These were subjected to operation before coming here. The results in these instances have seemed to fully justify the procedure.

ALCOVE BEDS FOR THE EPILEPTIC.

Presented to the Section on State Medicine at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, June 1-4, 1897.

BY EVERETT FLOOD, M.D.
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In presenting this subject I labor under the disadvantage of advocating a theory rather than a well demonstrated fact. Caring for the epileptic in such beds as I am about to describe has, so far as I am able to learn, never been tried. An approach has been made to it in a few places, especially in the asylum at Turin, where very narrow rooms are used, but the essential features of this plan are lacking.

The method is not advanced as a plan to be followed in all cases, but as apparently well adapted to certain conditions. The idea is to make an alcove, with walls of any firm material, either plank or brick, or brick with plank or board cover, just wide enough to easily admit the fully made-up bed. The bed should run on easy rollers and possibly project a few inches out of its alcove. There may be one alcove or many, side by side. This kind of a dormitory may be constructed on the ground floor or any floor above, provided the foundations are suitably strengthened, and no very great weight is added by this kind of construction. Each alcove is to have a suitable fresh-air ingress and a proper outlet for the warmed air. There may be a door to the stall or not, according to requirements. If a door is desired, then the bed can not project beyond the sides of the alcove, but may be flush with them.

There may be a single row of alcoves, or a double row in the middle of the room, or a single row at one side, or a row on each side. The better way would seem to be to have five to ten alcoves in each row. A double row head-to-head, running through the middle of the room so that the watchman can easily walk around the whole is the plan mainly considered.

The patient gets into bed over the foot, or the bedstead may be withdrawn, the patient is tucked in by the attendant and the bed then pushed back into its alcove. Experiments have been tried with different materials, and it is shown that sounds from one alcove to another can be so deadened that no serious discomfort would be occasioned by such noises as are ordinarily heard from this class of persons, while odors from one to another are absolutely prevented and each patient is breathing pure air. If a bed becomes soiled and is withdrawn from the alcove then odors might be perceived in the adjoining places, but the bed can be quickly stripped, the bedding thrown into the shute, which is conveniently placed, and ventilated, while the patient is being attended to in the bath. To make up these beds they must be withdrawn from the alcove and the clothing adjusted. The floor and walls of each place can then be properly cleansed and the bed pushed back.

Any one of us would, I am sure, prefer a dormitory of this sort to one where there is common air space for all.

With epileptic children the clothing is kept on the bed much better than in any other way and, in fact, it would be really difficult for the patient to get himself uncovered enough to take cold.

Opposite each alcove is a ventilated space for the patient to hang his day garments. The windows in this room are above such closed spaces.

The night nurse goes around quietly looking into each alcove in the row, or in the double rows, and need not disturb any patient either with her light or by any noise she might need to make.

The cost of such construction as this would manifestly be greater than for the ordinary dormitory, for it is natural to suppose that a room especially adapted to the use of this class of patients will cost more than one designed only for the ordinary insane or demented patient. The result to be reached is a more difficult one.

Details for the construction of the remaining parts of the building have been worked out, but need not essentially differ from other asylum buildings.

RELATION OF RAILWAY COMPANIES TO STATE BOARDS OF HEALTH.

Presented to the Section on State Medicine at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June 1-4, 1897.

BY G. P. CONN, A.M., M.D.
CHIEF SURGEON BOSTON AND MAINE RAILWAY, CONCORD, N. H.

In the last twenty years it has become a well-settled fact that State boards of health are primarily intended to take cognizance of the interests of health and life among the people of the State; and while it may be true that the work of a State board is to a considerable extent educational in its character, yet its scope is practically unlimited. Its observations and duties should not only pertain to the physical welfare of every citizen of a State, but business interests should receive due attention and the commercial relation of State, federal and international prosperity should never be ignored nor forgotten. Therefore, a bureau of health becomes an integral part of the executive department of a State, around which every citizen has the "inalienable right to life, liberty and the pursuit of happiness."

Such conditions represent the brightest and most potent exponents of a higher civilization, in which robust health for all classes of people is made possible. State pride is quite universal and progressive prosperity becomes a motto for every person as well as every vocation.

As an introduction to the subject I propose to briefly discuss and bring to the notice of this National ASSOCIATION, the above will serve to outline and emphasize the fact that hygiene, in effecting the moral and physical conditions of the inhabitants of every community, State or nation, must directly or indirectly have an influence in all business pursuits, including State, federal and international transportation.

It is a topic of much importance and, in a brief paper, can not be fully considered and therefore I can only hope to present to your notice a few of the more

salient points that are ever being presented to the railroad surgeon.

Problems involving hygienic principles in railway transportation will always be promptly referred to the surgical department of the road, for the reason that only such a department can deal with such questions in an intelligent and impartial manner. The surgical department of railway labor is the only section that is fitted by education and practical work to consider questions involving State, interstate and international sanitation, and in order to decide important questions regarding the life and health of the public and employes, the railway surgeon must keep in close touch with boards of health and other hygienic organizations of the country.

The public have become critical on all matters pertaining to life and health and now demand far more attention to sanitation than would have found favor a decade since and would not have been deemed necessary or expedient until within a few years.

Only a few years ago the National Association of Baggage Agents, recognizing that the public demanded more stringent rules and regulations in the transportation of dead bodies, held a consultation with experts in sanitation and formulated the following rules, which have been adopted by railroads and State boards of health throughout Pan-America:

Rule 1. The transportation of bodies of persons dead of smallpox, Asiatic cholera, typhus fever or yellow fever is absolutely forbidden.

Rule 2. The bodies of those who have died of diphtheria, anthrax, scarlet fever, puerperal fever, typhoid fever, erysipelas, measles and other contagious, infectious or communicable diseases must be wrapped in a sheet thoroughly saturated with a solution of bichlorid of mercury in the proportion of one ounce of the bichlorid to one gallon of water and incased in an air tight zinc, tin, copper or lead-lined coffin or in an air-tight iron casket, hermetically sealed and all inclosed in a strong tight wooden box, or the body must be prepared for shipment by being wrapped in a sheet and disinfected by a solution of bichlorid of mercury as above and placed in a strong casket or coffin and said casket or coffin incased in a hermetically sealed (soldered) zinc, copper or tin case and all enclosed in a strong outside wooden box of material not less than one and one-half inches thick.

Rule 3. In cases of a contagious, infectious or communicable disease the body must not be accompanied by any articles which have been exposed to the infection of the disease. In addition to a permit from the board of health or proper health authorities, station agents will require an affidavit from the shipping undertaker stating how the body has been prepared and the kind of coffin or casket used, which must be in conformity with Rule 2.

Rule 4. The bodies of persons dead of diseases that are not contagious, infectious or communicable may be received for transportation to local points in the same State when incased in a strong coffin or metallic case and inclosed in a strong wooden box, securely fastened so that it may be safely handled. But when it is proposed to transport them out of the State to an interstate point (unless the time required for transportation from the initial point to destination does not exceed eighteen hours) they must be incased in air-tight zinc, tin, copper or lead lined coffin or an air tight iron casket or a strong coffin or casket encased in a hermetically sealed (soldered) zinc or tin case and all enclosed in a strong ouside wooden box of material not less than one inch thick. In all cases the box must be provided with four iron chest handles.

Rule 5. Every dead body must be accompanied by a person in charge who must be provided with a ticket marked "corpse," and a transit permit from the board of health or proper health authority, giving permission for the removal and showing name of deceased, age, place of death, cause of death (and if a contagious or infectious nature) the point to which it is to be shipped, medical attendant and name of undertaker.

Rule 6. The transit permit must be made with a stub, to be retained by the person issuing it, the original permit must accompany the body to destination; and two coupons, the first coupon to be detached by the station agent at initial point and sent to the general baggage agent, the second coupon by the last train baggageman. The stub, permit and coupons must be numbered, so the one will refer to the other, and on permit will be a space for undertaker's affidavit, to be used in cases of infectious or contagious diseases as required by Rules 2 and 3.

Rule 7. The box containing corpse must be plainly marked with paster, showing name of deceased, place of death, cause of death and point to which it is to be shipped, number of transit permit issued in connection and name of person in charge of the remains. There must also be a blank space at the bottom of the paster for station agent at the initial point to fill in the form and number of passage ticket, where from, where to and route to destination of such ticket.

Rule 8. It is intended that no dead body shall be removed which may be the means of spreading d sease; therefore, all disinterred bodies, dead of any disease or cause, will be treated as infectious and dangerous to public health and will not be accepted for transportation unless said removal has been approved by the State board of health and the consent of the health authority of the locality to which the corpse is consigned has first been obtained and the disinterred remains enclosed in a hermetically sealed (soldered) zinc, tin or copper lined coffin or box incased in hermetically sealed (soldered) zinc, tin or copper cases.

These rules were made for the protection of the public against dangerous communicable diseases. While self-interest, to a great degree, on the part of the corporations in the protection of their patrons and employes against pestilential danger probably prompted this action, none of us can doubt but that our whole country has been benefited.

I have quoted these rules as but few of the roads in the East have been careful to post these regulations, preferring to rely on the health authorities to enforce the law. More widely circulated knowledge is necessary and I take this method of bringing it to the observation of the public and the profession.

Another sanitary consideration that is always of great interest to the managers of our local and through lines of transportation, is the management of serious outbreaks of infectious and contagious disease. The advent of cholera or yellow fever, at home or abroad, disturbs commercial centers all over the world. The declaration of federal or State health authorities that smallpox is prevailing in Canada or California as an epidemic at once creates excitement and very often leads to unwarrantable interference with transportation that might be avoided if the surgical department of through lines were in touch with State and national health officers. It is true a great and decided improvement in these matters has taken place since the epidemic of smallpox in Canada in 1885. At that time the Provincial Board of Health of Ontario was the only health authority in Canada worthy of consideration; while two of the New England border States were without health authorities and entirely helpless to meet the exigencies of the occasion. Michigan and Minnesota on the west, through their most efficient boards of health, asked our federal authorities to interpose the protecting power of international quarantine.

Everyone understands that international problems require considerable time for solution and that diplomatic correspondence is oftentimes so dilatory as to be very exasperating, while every sanitarian understands that epidemics of contagious disease have no respect for geographic or municipal limitations, nor can be dispelled or discomfited by proclamation or diplomacy. The results of the appeal to the federal government in the West being far from reassuring it was determined in New Hampshire to appeal to the railroads to take the initiative and lead in public sentment rather than follow in its wake. This seemed the more necessary by reason of municipal reports

from Montreal that there was no epidemic prevailing and the fact that the Province of Quebec was without a health board that could furnish reliable information.

The epidemic was well developed in Montreal early in July, and in August the health board in New Hampshire, realizing that nothing was being done to restrict the spread of the disease, determined to warn the management of the great through lines of transportation traversing New England and the Canadas of the danger they were in of having a panic that would unnecessarily disturb transportation and might lead to a complete embargo by reason of a shotgun quarantine.

This notice was most kindly received and the managers of international transportation interests asked for information and instructions of what was necessary to protect and maintain their traffic engagements. The result of this information was a conference of railway managers and surgeons with the boards of health of New Hampshire and the Province of Ontario. This took place in the city of Montreal. A delegation from this conference met by appointment a committee of the Montreal city government. This committee, while admitting there were some cases of smallpox in the city, strenuously asserted that it was far from being an epidemic. This statement was utterly and irrefutably answered by Dr. Coverton of the Ontario Board of Health, who brought to their notice duly attested certificates of deaths by smallpox, which showed that 127 had died during the previous week and 39 the day previous. The daily records of deaths were sufficient to show the increase of the epidemic week by week and it is to the credit of the mayor and city government of Montreal that they willingly adopted a course of rigid investigation that brought into existence not only an efficient health board for the Province of Quebec, but also a Dominion board of health that is receiving commendation and support from sanitarians all over the world.

In bringing about these results and municipal reforms a great deal of animosity was engendered among the ignorant and superstitious. The anti-vaccination element in society took it upon themselves to stir up dissentions, riots prevailed and large numbers of the inhabitants boldly proclaimed that they would not submit to such rules and regulations as were deemed necessary to suppress the epidemic. The government was most ably and earnestly supported by the railroads, as a single instance will verify.

The inhabitants of a small suburban station in which was posted the rules and regulations considered necessary to protect its people and the inhabitants of other places, took occasion to send word to the division superintendent of the road running through the town that they would not submit to the rules and tore down the copies that had been posted. No further rules were sent them, but the next day every train passed that station at the rate of thirty miles an hour. The station master closed up the depot and it remained closed until the authorities of that town appointed a local health board and instructed them to support and carry out the rules and regulations that had been adopted by the managers of all railways in Canada.

A single instance of this kind was amply sufficient to bring about a reform and the people of that section were very soon educated in the elementary principles of hygiene. It is but a simple act of justice to these people to report that in a very short period they were enthusiastic supporters of every rule and regulation that gave assurance of protecting themselves and neighbors from the direful effects of a loathsome epidemic.

In less than sixty days the epidemic was stamped out and the rules and regulations abandoned. It is but fair to the management of those roads to state that with the exception of the importation of rags and paper stock there was no interruption of the running of either passenger or freight trains, neither was there any development of the disease in New England. Sanitary inspectors examined all through passengers while in transit, many were vaccinated, some were quarantined as suspicious cases and a great deal of baggage was thoroughly disinfected at division and international points.

In a paper of this kind designed for an association of medical men it is unnecessary to multiply instances of this work, neither am I disposed to flatter myself that I am imparting any new information to the members. Still it is probably quite true that a great many of the managers of our railroads have never been called on to provide for the stamping out of an epidemic of this nature, therefore if this shall be the means of bringing a work of this kind to their notice it will have served its purpose.

NATIONAL MEDICAL LEGISLATION.

Presented to the Section on State Medicine at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY JAMES T. GREELEY, M.D.

NASHUA, N. H.

I have the honor to address you on this occasion in behalf of action, already initiated, well-advanced and generally approved by you and by the profession of this and of foreign countries, because it is designed and calculated to raise the character of the profession, to exalt the capacity of those on whom the welfare of all mankind rests, to weed out or fitly qualify those empirics who are at once the bane of medicine and the terrible foes of social health and of all prosperity. The intention is necessary, is wise, practical and permanent. Its propriety is demonstrated as well by the notorious evil against which it is leveled as it is by the patent values of the purposes for which it is framed. Wherever attempted it has been crowned and laureled both by popular and professional approval. It appeals to all who desire health for themselves or others; is simple and unequivocal; criticises those only who are notoriously unworthy of tolerance and exalts modest merit as much as it condemns charlatanry, ignorance, impudence and murder. Briefly expressed, this movement approves, tends and works for a higher, a universal law, which shall raise the standard of medical education in all schools, weed out practitioners who, under whatever sounding school title, are evidently unfitted to judge the issues of life and death, and perform the duties for which they are employed, and thereby raise the practice of medicine to a level with that of other arts and sciences upon which mankind depends for its welfare and permanence, for its very being. Fortunately, I address those who are experts in all that pertains to the subject matter, and who have been deterred from action heretofore only by the enormity of the evil and apparent hopelessness of David fighting with Goliath. Their judgment is our own, their sympathies are ours. We labor only to have that

judgment and their sympathy expressed and forced forward in order to place the profession in this country far to the front, and the sound health of the community attained and preserved. To secure this unquestionable benefit I address a select body of scientific men who were thoroughly trained for their duties, who have kept step with all advances, whose merits commend them to the confidence of their patients and their communities, and who are vitally concerned in the maintenance of sound doctrine and in the abrogations of charlatanry as the minister in his pulpit or the judge upon the bench.

We seek a comprehensive law to regulate the practice of medicine; a law which shall render medical quackery as dangerous as highway robbery, or more so; as disreputable as chicken stealing; which shall positively require competent knowledge as a condition *sine qua non* to a degree; and which shall be enforced by competent pains and penalties. Is there one here present who dissents from this object, who will state that it is either unnecessary or insufficient? I hear no such avowal. Were there such, even one, I would refer his opinion to the opinions of the great medical luminaries of France, of Germany, of Great Britain and all Europe, who have for years insisted that the physician's education should be *teres ac rotundus*, round and full; that it should be kept so in the light of later discoveries; that quacks should be prevented from undermining the public health and that every gain in every art should be sifted for its medicinal uses But really, there is no scientific, no professional nor reasonable objection to our demand. The only antagonism proceeds from those men who wish to secure the honors and rewards of medical skill without learning what medicine is, without mastering anatomy, without acquiring chemistry, without such knowledge of botany even as that which stored the good wives' simples in one century and the pipsissewa and patented concoctions in another. They are animated by the same spirit which led the Ephesians to worship Diana—that of gain.

But this is not modern medicine. Modern medicine requires its pupils to thoroughly know the anatomy and make-up of man; the nature, stage and history of every disease, and to know as thoroughly the means and agencies to be employed in every event. Coke-Lyttleton said that law should be comprehended in theology, because it treated the way in which God operates. Under that rule, medicine should rate even higher, since it prescribes a cure for the evils which it alone can detect. It is the supreme and constant arbiter of human life and as such derives its knowledge from the most recondite sources, and ascertains its prescriptions from all that is old and all that is new. The most gifted can scarcely hope to compress all that is set before them in this task. What can the ignorant unlearned quack really do with one cure-all and a dozen alternatives?

I have spoken generally, but my speech is not without ample and educated reply. The officers of many boards of health, medical societies, registers of health, etc., replying to letters of inquiry concerning the evil and its remedy, have stated directly, or *inter aliis*, that "under the act just passed in this State (Massachusetts) the traveling quacks have left the State and we expect still better results." The secretary of the South Carolina Medical Examining Board says: "The State law works well; has raised the standard of the schools and will keep tramp doctors out." The secretary of the California Board of Health says: "There is a restraining influence in the law and I do not know that other States are better situated so far as quacks are concerned." The secretary of the Wisconsin Medical Society says: "The laws relating to medical practice are exceedingly lax, in fact, a dead letter, no registration being required and there being no board of examiners. I am in favor of most any kind of a compromise with the 'sectarians' in order to get a board of some sort that will help us to get a law passed." The Nevada Board of Health remarks that "the recorder is the sole judge of the genuineness of a diploma and the standing of a college, which makes the law an absolute failure."

In South Dakota "the enforcement of the law has compelled unqualified practitioners to leave the State and has compelled some medical societies to raise the standard of medical education." The Missouri Board of Health says: "The law has prevented the location of quacks and charlatans in our State; whenever a man having a diploma from a recognized school has been guilty of unprofessional conduct, we have revoked his license. We have advanced the standard of our medical societies and will soon require changes to elevate the standard of preliminary requirements." The Montana Board of Medical Examiners states: "Our law has operated to the entire satisfaction of all persons except those who have felt its weight. Our ranks are singularly free from impostors and quacks and the stranger can send for a physician assured that he will get a reputable one. The laity are in sympathy with our law and discriminate between educated and uneducated men." The State Board of Minnesota says: "The law has been very effective for nine years and has given the State the best profession of any State in the Union. We trust to improve it by increasing the preliminary education of our candidates." In Delaware "the law has been in operation a year and has given general satisfaction, although the homeopathists opposed it. Our State was a dumping ground for those who could not pass the boards of other States, and we copied the law of Pennsylvania which was very satisfactory." In New York "the general standard has been raised by the enactment of the law." North Carolina: "The law regulating the practice of medicine has been extremely beneficial in raising the standard of the profession. Our law is the oldest in the United States." The Washington (D. C.) Society "is urging Congress to legislate for its protection, and its hopes will soon be fulfilled." The Kansas Board "is making a desperate effort for the enforcement of its law all over the State, and hopes the next legislature will enact a better." In Indiana "the law is no law and the State Medical Society wants a four years' graded course and a rigid examination by a non-partisan board. As it is the State has no law on the subject." In Idaho "the effort of the State Society to establish a State Board of Examiners was defeated by the quacks, but this winter will see such a bill passed."

Such is the law as it stands in so many States. Such are the reasons for the enactment of a general law that will protect the people from malpractice and ignorance and protect competent physicians from the rivalry of quacks and charlatans. There is every reason why such a measure should be perfected, rendered uniform, and nationalized. The end can be won only by united action, and that action can be

secured only by combined and persistent labor. The desired end being approved by reason and testimony, let us formulate the legislation required, and, co-operating with every State in which the *mens sana in sano corpore* is preferred to ill health and dishonest medicine, press it unitedly and persistently. Earnest endeavors will secure universal approval and we shall see our bills of mortality reduced and the just desire of the medical profession endorsed by popular and general approval. The object is National; let the effort be as general.

MORE PHYSICIANS AND LESS LAWYERS IN CONGRESS AND LEGISLATURE.

Presented to the Section on State Medicine at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June 1-4, 1897.

BY EPHRAIM CUTTER, M.D.

NEW YORK, N. Y.

The present number of physicians in the United States Congress is ten. Lawyers are 303, or about 70 per cent. (See Appendix A.)

The present is a good time to discuss this, as a department of public health in the President's Cabinet is advocated, and as the Government attends to the biologic needs of plants, cattle, hogs and sheep more than they do to the same needs of human beings.

Public health is worth more than coal, gold, houses, lands, silver or wine, although it is unlisted in the census of National wealth. There is need of physicians awaking to a realizing sense of their National rights and importance as citizens, especially in governmental bodies.

Congress and legislatures are representative bodies of the people.—Professional people alone are not truly represented. The law alone can not represent medicine. There are in the United States some 75,000 lawyers who represent some 49,000,000 of people. This is altogether beyond reason and this is said with no reproach. The same proportion of physicians and clergymen in Congress would be as bad. This was seen in the Methodist International Conference, held in the Metropolitan Opera House in New York some years ago, and in the AMERICAN MEDICAL and in the British Medical Association meetings. To me it seemed as if the clerics and medics argued as acutely, split hairs as finely and delayed business as refinedly as their legal brethren in Congress. Probably they could do no better.

When suitable persons can be found in all professions and employments in the United States they should be representatives in Congress, to avoid the "mint, anise and cummin" modes of doing delegated business.

I speak for 120,000 physicians in America and give the following reasons why they should be in Congress in larger proportion to lawyers than 10 to 303:

1. Out of fifty-six signers to the Declaration of Independence, two were physicians, *i. e.*, Benjamin Rush and Lyman Hall. Twenty were lawyers, according to the best of my information. Thus medicine was to law as one in ten. This is better than one in thirty.

2. Physicians are citizens entitled to representativeship.

3. Physicians come into more intimate contact with the people and know them more intimately than any other class of professionals.

4. They are all the time studying *evidence* more than are lawyers, because life or death is involved in their business more.

5. The emergencies physicians meet far excel those that lawyers meet. Physicians at any time are liable to be called to attend the highest officials, whose lives are of priceless value to the Nation, and at once physicians are made to fill all the functions of lawyers; to be as to evidence, counsel for, counsel against, judge and jury, promptly within a few minutes, sometimes three, and on the physician's action depend the life or death of, it may be, a president! It took the law six months to decide Guiteau's case, but a shorter time to settle that of President Garfield, the victim. Physicians must exert the same qualities of mind as lawyers, but how much more rapidly! Matters of medicine are always coming up in State affairs which physicians should decide, not lawyers. It is needless to enumerate.

6. The effort to have a department of public health in the Cabinet is evidence that the public sees that lawyers can not and ought not to administer such matters, just as it is proposed to have a cabinet department of commerce and manufactures. The fitness of things urges this action. A physician in the Cabinet would be a rarity, but we aver that he ought to be there as to State medicine.

7. The good effect of having medical examiners in place of unmedical coroners is an argument in favor of our position. Its efficiency, economy and common sense are very palpable when this plan has been adopted.

8. The effect of physicians in their own department being ruled over by lay people is embarrassing, harassing, if not paralyzing. In our late war this was done away with in some cases and with the happiest results. At any rate, in 1889, British army medical officials made the most favorable comments on this and alleged it as a superiority over English administration. A like exaltation in Congress might do as well.

9. Laws have been passed, or tried to be passed, as to medical matters, which are not complimentary to the legal fraternity, as on their faces they showed a want of acquaintance with the subject. Once there was an effort of Congress to award $100,000 for a cholera cure. It was required that all cases should be cured for one year. The lawyers forgot that this was impossible from outside causes, *i. e.*, feeble constitutions, late stages of disease, want of response to remedies and natural death rate. Sometimes the poison of disease is so powerful that the most active remedies fail. You can kick dead lions, but not some live dogs. Again, medicines act differently on different cases.

10. It is the right of physicians to be better represented in Congress because of legal medicine, and to do away with the disgraceful pitting of medical experts against each other. Commissions should be appointed as in France.

11. The medical profession is the most public spirited in deeds of charity. It gives away most to the public in unpaid labor. It has not its equal in its self-denying labors, in season or out, by day and night, summer and winter, storm and calm, danger and safety, for the worthy and unworthy. No profession works so hard to render its ministrations or existence needless. Many physicians pass their lives in going about doing good, and die poor because they

have so freely given away their ideas and substance to the poor and needy, and to the rich and well-to-do. This entitles them to places in Congress, as they prove they seek others' good.

12. The greatest physician never gave a bad character to other physicians, but pronounced repeated woes on lawyers.

13. Physicians are remarkably faithful to trusts. Surely those who trust their lives and bodies to physicians would trust them to aid in making biologic laws.

14. Our legal friends need the aid of other representatives in Congress. Although lawyers were in control of Congress for a century, still they failed to provide a proper presidential succession bill, and Hayes and Tilden were muddled with no way of relief open. None knew who was elected, politicians were at sea. Had the United States been Mexico it was said that civil war would have followed. But a Philadelphian, educated at Yale for governmental affairs, suggested that President Woolsey of Yale should head a petition that twenty-five prominent democrats and republicans should informally meet at the Fifth Avenue Hotel, New York, and consult. It was done. The course submitted by the democrats was adopted and Mr. Hayes was elected. Here President Woolsey, never a lawyer nor politician, had such an influence from his character and natural and acquired abilities, that he solved a problem for legislators. Surely they needed him!

Again, about 1815, France paid us millions of dollars for spoliation on our commerce. For nearly seventy years lawyers in Congress kept the money back, and when paid gave no interest! The unwisdom of this appears when it is said that, had these millions been paid to an individual, and he acted as our Congress did, there was not a lawyer in Congress from 1815 to 1885 but would have sued the trustees and heirs and made them pay principal and interest. If Congress had had the normal proportion of physicians, scholars, clergymen, bankers, farmers and others to help the said lawyers act as they would have made an individual trustee act, and refused for seventy years to so act themselves, then the suffering of those kept out of their lawful rights would not have been. It is doubtful if physicians would have acted so, because they are all the time relieving others' physical woes.

15. Physicians are needed in Congress to put through the department of public health in the Cabinet. It is said that Secretary Bliss was looked at unfavorably because he is a merchant. Even the charter of Greater New York provides for a non-medical man to be at the head of the board of health! The lawyers want it all.

16. More physicians are needed in Congress to see that man has his foods protected, as plant and cattle foods are protected. The adulteration of human foods and medicines is awful. When the adulterants are held to account their lawyers come to physicians, who have been most earnest in detecting such frauds, to aid in getting a light sentence. Connecticut is the only State, I am told, that has the same laws for the food of man, beast and plant. Prof. S. W. Johnson of New Haven, was the author of this common sense bill.

17. Physicians are needed in Congress to see to other causes that hinder the biologic developments of man. The family is the unit of the nation. If one is sick and feeble the other is so. Grand and noble mothers have made English and Dutch speaking nations great. None are better able to tell how to have healthy families than physicians. If States need such laws, physicians should make them. What is there more valuable to a nation than healthy human beings?

18. If physicians, lawyers and others had proper representation in Congress, more time would be spent in work and less time in words.

What a lawyer said about Congress.—We quote from "Thomas Jefferson's Works," published in 1854: "Our body was little numerous but very contentious. Day after day was wasted on the most unimportant questions. . . . I served with General Washington in the legislature of Virginia before the Revolution and during it with Dr. Franklin in Congress. I never heard either of them speak ten minutes at a time, nor to any but the main point which was to decide the question. They laid their shoulders to the great points, knowing that the little ones would follow of themselves. If the present Congress errs in too much talking how can it be otherwise in a body to which the people send 150 lawyers, whose trade is to question everything, yield nothing and talk by the hour? That 150 lawyers should do business together ought not to be expected."

19. Finally, physicians are needed in Congress to enforce all that is good in this Section of State Medicine.

As this is written, Dr. Gallinger, the only physician of the Senate, is an object lesson to illustrate this article. May 13, 1897, he reported an admirable vivisection bill. The same day he introduced a resolution for a $50,000 appropriation for Americans in Cuba who were starving. He did this much to the approval of all good and true. Physicians can not stand and let folks starve to death. But Senator Gallinger would do much more if he had his proper number of medical colleagues, in place of being all alone. The writer wishes to be understood. He does not object to lawyers in Congress, but to the excessive proportion of more than two-thirds. This is not representation, it is assumption.

Appendix A.

THE OXFORD HOTEL, WASHINGTON, D. C., Feb. 2, 1897.

My Dear Dr. Cutter:—Tough job! Plenty of doctors outside of Congress, but inside scarce as hen's teeth. So here goes. One senator is from New Hampshire. Representatives: One each from California, Kentucky, Maryland, Missouri, Ohio and two from South Carolina. . . .

Very truly yours, RALPH DUNNING.

SOME FEATURES RESPECTING THE DRAINAGE OF THE LARGER MUNICIPALITIES.

Presented to the Section on State Medicine, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY AUGUSTUS P. CLARKE, A.M., M.D.
CAMBRIDGE, MASS.

One of the chief difficulties to be overcome in the management of a large municipality is that which is encountered in providing a proper system of drainage. The method that was established at an early date consisted in the construction of small drains so as to have them open out into a ravine or natural watercourse. Sometimes the large mains had their openings at the mouth of a river or directly into a harbor

or bay. The objection to such a plan of laying sewers is in the tendency of the sewage matter to become deposited after a lapse of time upon the banks of the river and shores of the deeper waters. The odors given off by the deposition of such material after it has been exposed to the sun, winds and fogs are at times of the most unsavory character. Their baleful effects, however, have not always been fully recognized, especially when they have occurred in the vicinity of those towns where large establishments of commercial interests, such as pork packing, grease rendering, bone grinding, soap manufacturing and other offensive trades have been conducted. I can readily recall the bitter contest that took place some twenty-five years ago in our Boston metropolitan district over a condition of affairs not unlike that to which I have here referred. In deciding as to the dangers of allowing the continuance of those evils, in unraveling the threads of such a complication and in devising measures for their relief, the highest authority of the State government, including the municipal council, the city and the State boards of health, the supreme judicial court and the legislature, had to be invoked. The testimony offered by some of the witnesses is still worthy of comment. One leading chemist stated at the aldermanic hearing held at that time that he had made a careful investigation and found that the unpleasant smells were due to the presence of acrolein, which had been produced in some of the large business concerns and that this product had been formed by the exposing of certain fats and oils to a prolonged temperature, which was somewhat less than that of the boiling point of common water, and that the rapid tarnishing of the silver on the door plates and household utensils and the discoloring of the paint on houses and fences in the vicinity were due to the oxidizing agency of this peculiar chemic element. Another distinguished chemist, who was a witness for the offensive trades' establishment, stated that he had given the subject much attention and had found that the foul and disagreeable odors were not due to the formation of acrolein, that no such chemic compound had been generated in the processes of rendering oils and fats, and that such a substance could not be evolved unless at a temperature that should be above 500 degrees, and that the raising of heat to such a degree would cause an immediate explosion of the vessels used and a destruction of the buildings in which such work would be carried on. He attributed the odors to the presence of sulphuretted hydrogen and sulphid of ammonium and other noxious gases that were disengaged from the sewers and from the flats of the lowlands upon which the drainage matter had been deposited. The result of the legal contest was, that after some of the principal business firms had through compromise agreed to improve the conduct of their manufacturing processes by introducing some improved machinery and by passing all foul-smelling gases through redhot tubes, the government was compelled to incur a debt for a large outlay in filling up the river bottoms, in dredging out the channel and in the construction of a number of trunk sewers for carrying the drainage matter into the deeper portions of the Charles River estuary.

Since then another great expense has been incurred for the construction of the metropolitan sewer for conducting the sewage far out into the harbor, where it could be pumped up and then so discharged as to be swept away into the sea by the ebbing of the tide. Though much has been accomplished by the completion of the undertaking, still it must be admitted that the capacity of these mains is far from being adequate for effecting the purpose which it was hoped their construction would fulfil. The surface and storm waters so necessary for diluting and attenuating the sewer contents can not be carried off by these channels, but have to be diverted in other directions for final disposition. For the more inland cities and larger town centers other methods of drainage have been attempted.

In Brockton the plan of sewerage and of the sewage disposed consists in the construction of main sewers and a reservoir into which the sewage is discharged to be stored through the night, before being lifted by means of a pumping station and carried by a force main into large filter beds raised a considerable distance above the natural water level of the ground. The filtration material consists of fine sand and gravel, the coarser portions being nearer the surface. The area in which the filtration takes place comprises about thirty acres of flat sandy land, most of which is situated in the town of Easton, and is divided into twenty-three beds. Each bed occupies a surface of about one acre. From twelve of the beds the subsoil was removed, from six the removal was only in part, in the other beds the subsoil was allowed to remain upon the land. The material, including the loam that was removed, was utilized in preparing the embankments between the filtration beds. Beneath a number of the beds a layer of clay, at the depth of upward of seven feet was found, over this was laid a series of five-inch under-drains that were connected with a fifteen-inch pipe carrying the percolating water into a brook, a small branch of the Taunton River.

The report of the board of 1895 says, substantially, that when the beds were left with level surfaces they froze in the winter to such an extent that the sewage could not be disposed upon them. When they were furrowed, however, notwithstanding that a low temperature prevailed, no trouble was encountered in this respect.

In considering the advantage which this method of sewage disposal affords to inhabitants of towns, it will be seen that some serious objections to its general adoption will become apparent. In the first place this plan of arrangement which has been denominated as the separate system, imposes the necessity of excluding all surface water and all ground water from the street sewers and the house connections. The material must therefore when disposed upon the beds, be in a more or less concentrated condition.

Another feature that should be considered in this connection lies in the general use of meters in the distribution of Brockton's water supply. It is well known that when such a device for a water service is employed many families will reduce their water for consumption and of waste to the lowest minimum, thus leaving their house drains and sewers inadequately flushed and permitting them to become the *nidi* of disease germs.

Reference to the published report of the city engineer of Brockton shows that, though the population of that place in 1895 was 33,165, the average daily flow at field during the month of January of that year was only 215,000 gallons; in February it was 109,000 gallons; and in July yet less, being only 195,000 gallons. In October, when the amount discharged had reached the highest point of the year, it was only 488,000 gallons. Examination of the

report of the chemic analysis is interesting. The amount of free ammonia that was determined per 100,000 parts was 3.45, that of chlorin was 9.05. A foot-note states that the odor was offensive; the sample was collected as the sewage flowed out upon the filter beds. A chemic examination of the effluent from the underdrain at the Brockton Sewage Disposal Works, according to the report of the State Board of Health shows that the sample collected in February, 1895, when it contained a large amount of ground water, had no odor. The amount of free ammonia per 100,000 parts was reduced to .0248 and the amount of chlorin to .75. A visit which I made to the Brockton filtration beds in Easton, Feb. 6, 1897, revealed the fact that there was more or less offensive odors being exhaled from the beds for the sewage deposits. The same was observed on a visit I made there only a short time before. I was informed that much offensive or unpleasant odor had been noticed by people who were living or traveling in that vicinity.

The sewage disposal of Amherst is called the separate type system; it embraces only house drainage. The drainage matter is conducted to a settling tank about a mile from the village, thence it is carried through a pipe 520 feet in length to Fort River. Some of the sledge is removed and is used as a fertilizer on neighboring farming lands.

The sewage of the city of Worcester is exposed to chemic reaction before it is discharged into the Blackstone River. An analysis of the water shows that the pollution of the river decreases as the distance becomes greater.

An interesting fact has been brought out through the study of the relation which the cities of Lawrence and Lowell have to the Merrimack River. The water supply of Lawrence is taken from the Merrimack, which receives the drainage of a considerable portion of the State of New Hampshire; it is only nine miles above the intake of the Lawrence waterworks that the sewage of Lowell enters the river. Typhoid fever had prevailed extensively for the past years in Lowell and Lawrence during the later portions of the autumn and winter months, after the disease had nearly ceased in the towns higher up the river. Sometimes the epidemic would appear in Lowell before it reached Lawrence It should be stated that the intake of the Lowell water supply is from the Merrimack at a point somewhat above the location of the city. The large death rate occurring from typhoid fever led the board to conclude that the occurrence of the attack was owing to the disease germs that were brought down the river and that they infected the water which was furnished for the use of the inhabitants. The invasion of typhoid fever was subsequently checked by the use of sand in the construction of filtration beds which served to remove to a considerable extent the disease-producing germs.

The Board of Health further concluded that streams are insufficient for self-purification; that it is practicable to protect, to a marked degree, the community against the contamination of water that is supplied for domestic purposes, by the employment of properly constructed sand filters.

It would be interesting to consider the plan of purification of the sewage and the methods of drainage of other cities and towns of Massachusetts, but it will be sufficient to say that such systems must be regarded as merely tentative.

The plan adopted by Brockton recalls to mind the practice that was in vogue during my early school days when the farmers in southern New England used to make large sand beds upon their fields and, into the pits that were made in them, would deposit the contents that were brought from the city privy vaults. The matter was allowed to remain until it soaked into the mass of sand or other material that was used for holding the sediment. Under or near the beds there was usually made a ditch or trench along which the vile water, after percolating through the mass, would flow and be carried into a neighboring ravine or hollow. The effect produced on our olfactories when we were passing in the vicinity gave unmistakable evidence that the "noxious effluvia" was invading our atmosphore far and wide. We also recall the fact that those districts in which it used to be the custom to deposit such masses of exuberant ordure have since become the veritable haunt of the bacillus malariæ and other disease-producing germs.

Though all must concede that the details of the present plan for the disposal of sewage have, through the advice and suggestions of the State Board of Health, been carried out in a most creditable manner, still it can but be felt that some more effective and scientific system of drainage for the rich and densely populated States should be inaugurated.

My recent visit to the Republic and City of Mexico afforded many opportunities for reflection. While there I had the privilege of visiting the drainage works of the city and of witnessing the admirable working of the desagüe and the tunnel that had been constructed, at great expense, for insuring the drainage of the City and Valley of Mexico and for conducting the sewage and the water of the lakes into the Gulf of Mexico. I will not describe in detail the plan adopted, but the method employed by the Mexican government embraces a subject that should receive the most careful consideration.

Many portions of New England and of other States adjacent to them present features for which the Mexican plan, more or less modified to suit local conditions, could no doubt with great and permanent advantage be adopted. The employment of such a method would tend to obviate many evils of our present system of drainage.

In constructing a canal after the plan I have mentioned, its bottom should have a uniform slope, its sides should be so projected as to have a proper batter, and its capacity ought to be sufficient to receive all waters that should be carried off. It should be of such a depth as not to be seriously affected by freezing during the colder months of the year.

It is far from pleasant for one to contemplate that in the future, not altogether remote, there should abound at no distant intervals all over our land and in the vicinity of the delightful prospects of the natural water courses huge piles of sand and gravel to be continually savored with the drainage of human excrement, that vilest of all products; and that such a condition must from the very nature of things be established in the limits or near a village, where the remonstrances of the unoffending inhabitants shall be made only in vain against the death-dealing odors and poisons that are likely to be brought to their midst.

One step that might be taken, which would be helpful in bringing about an improvement in the methods of sewage disposal, would be in the enforce-

ment by the government at Washington of more stringent regulations for the protection from pollution of all the navigable rivers and streams. Such protection should extend not only to the end of the navigation lines but for some distance beyond so as to include control of the important branches of such watercourses. All persons, including private individuals, persons connected with companies, corporations, towns, cities, and with the management of States should for the violation of such provisions, be subject to indictment or to the penalty of the payment of a fine.

AIR—ITS USE AND ABUSE.

Presented to the Section on State Medicine at the Forty-eighth Annual Meeting of the American Medical Association at Philadelphia, Pa., June 1-4, 1897.

BY JAMES W. COKENOWER, M.D.

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DES MOINES, IOWA.

The air we breathe is a subject of such magnitude and diversified uses, and corresponding abuses, like all other valuable elements that augment our mechanical, physical and therapeutic existence, that the limited time of this paper will only permit me to speak of the atmosphere in a general way, that it may be used to lengthen our longevity. It is employed in the treatment of disease in many ways and for many purposes, is used as the medium from which we get oxygen, is found in a gaseous mixture of definite composition, with a variable pressure, is used as a vehicle for other substances in a gaseous or finely divided state, and is also selected as a medium by which the temperature of the body may be readily and effectively influenced. The principles in which the dual relations of the air stands to the economy as a definite compound of certain gases, and as an atmosphere with a certain pressure, is very frequently disturbed, and this disturbance or abuse accounts for some of the most familiar phenomena of disease. Abuses in the alterations in the quality or quantity of respired air, whether from the state of the atmosphere itself, or from derangement of the complex apparatus of respiration and circulation, is the cause of some of the most serious and distressing diseases of the chest, and should prompt us to utilize all available means to change the compositions, or volume, of the air used, which is all the more practical because the supply is unlimited and composition altered at pleasure by increasing or diminishing its pressure.

We find, accordingly, that ever since the discovery of the composition of the atmosphere, frequent trials have been made of its value therapeutically, and oxygen was early recognized as its active constituent and came to be administered, as it is still, in the form of inhalation.

Within the last few years a remarkable advance has been made, on the one hand, in the physiology of respiration and the relation of the circulation to the atmospheric pressure and, on the other, in the pathology of disease of the chest.

Clearer views have been reached on the signification of various symptoms, and especially of dyspnea in its different forms and observations upon the effects of compressed and rarefied air. The modern therapeutist has availed himself of this knowledge and revived the use of air, physically altered, in the treatment of disease of the lungs, heart and other parts of the body with accuracy and successfully, and the aerotherapeutist of today has come to stay, and his methods a recognized factor in preventive medicine.

The physiologic effects of rarefied air will manifestly be different accordingly as it is admitted to the body as a whole, or only a part; and familiar examples are afforded by descent in the divingbell or ascent in a balloon; and is obviously indicated in diseases where inspiratory dyspnea is an urgent symptom, spasmodic asthma, stenosis of the air passages from anatomic causes, acute and chronic bronchitis. In threatened phthisis it is used prophylactically, and in chronic pleurisy it may prevent the collapse and retraction of the chest wall. In cardiac dilatation, due to mitral incompetence, it is useful; in general nutrition, combined with other remedies, it will relieve anemia.

We might continue indefinitely the theory of the uses and abuses of air, but enough has been said in a general way, we hope, to preface the practical utility of air as will be most beneficial to the well, the sick and, last but not least, the physician.

Investigators have been trying to discover the causes of the bad effects of defective ventilation, and while some have attributed them to excess of carbon dioxid, or deficiency of oxygen, or to both of these factors; others, and even Brown-Séquard, believed that even healthy animals exhale a volatile organic poison of the nature of an alkaloid or ptomain. Drs. Billings, Mitchell and Bergey have, in an extensive series of experiments, failed to find any trace of a volatile poison in an expired breath. However, they did find a very small amount of ammonia and combined nitrogen in human breath, and show that this is due to decomposition of organic matter in the mouth and pharnyx, but not of any peculiar volatile organic poison. They find no evidence whatever, and believe the high mortality of persons living in crowded dwellings is now known to be due in a large part to specific hereditary and acquired diseases, and that the good effects of increased ventilation are to be attributed, in a large part, to the lessened quantity of dust particles to which micro-organisms adhere. The offensive smell of public halls and places of entertainment is, in their opinion, due to volatile products, or decayed teeth and foul mouths, to fatty acids given off in the excretions of the skin, and to the means used for illumination. I do not believe as Drs. Brown-Séquard, Billings, and a few others, but think they have taken an extreme position on the question of the merits of rebreathed carbon dioxid. Yet, I believe if more attention was given to the character of atmosphere we breathe, and the manner in which it is taken into our lungs; if more attention was given to ventilating places of public gatherings, especially school houses and, last but not least, the sick room and private residences; if more thought was given to the noxious influences of confined air upon our physical, as well as mental economies; and if more thought was given to the therapeutic effects of the air, and less to the therapeutic benefits derived from drugs, we would succeed in many instances where we now fail, while 'tis true all either can do is to assist nature and exercise such influence on the morbid changes in tissues and organs as to restore the parts to a state compatible with systemic life.

There has recently been practically and emphatically demonstrated in Iowa the amount of good the

combined influence of the physicians of a State can do when they pull together to mold public opinion, by the recent new medical law passed by the Iowa legislature. Realizing then the wielding power of our forces, it is our bounden duty to utilize our influence in molding public opinion in a way that all public and private buildings shall be so arranged and used, and that persistent attention will be given the subject, to the end that we may all have a pure atmosphere to live in, and our patients pure air, as well as pure drugs, to relieve them of their ills and promote their convalescence.

THE SIGNIFICANCE OF THE OCCURRENCE OF PATHOGENIC SPIRILLA IN THE WATERS OF THE DELAWARE AND SCHUYLKILL RIVERS AT PHILADELPHIA.

Presented to the Section on State Medicine at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY D. H. BERGEY, A.M., M.D.
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As a result of a systematic study of the waters of the lower Schuylkill and Delaware along the city front during the past year, I have found over a hundred spirilla, many of which possess pathogenic properties when inoculated into the lower animals, notably pigeons and guinea pigs.

A careful study of the morphologic and biologic characters of these organisms shows that many of them are very closely allied to the group of pathogenic spirilla with which we are already familiar, the most important member of that group being the spirillum choleræ Asiaticæ, or Koch's common bacillus. The resemblance in some instances is so close that one not expert in the exact differentiation of the members of this group of organisms would be unable to detect any differences. Others deviate slightly from this type, while a considerable number show more or less marked deviation from this type.

A considerable number of these organisms are apparently identical with the vibrio Schuylkillensis isolated from the water of the lower Schuylkill last year by Dr. Abbott.[1]

The organisms were isolated from samples of water collected at different points on the two rivers along most of the city front, and from samples taken from the main and branch sewers of the city as they discharge into the rivers. Several organisms were also isolated from the water supply of the Laboratory of Hygiene, University of Pennsylvania, where the research has been conducted. These organisms were found to be most plentiful during the summer months, but were found to persist in limited numbers during the fall and winter months. About the middle of March of this year they appeared to have again increased somewhat over the numbers found during the winter months. Since they were found each month from June, 1896, to March, 1897, it is safe to assume that they are present during the entire year.

It is not necessary at present to go into details as to the general morphologic and biologic character of each of the organisms found. This will form the subject of a future report. Morphologically the different organisms varied somewhat as to the length and thickness of the rod, the degree of curvature and the tendency to form short or long spiral chains. Considerable variations were also noted as to the biologic characters of the different organisms, as, for instance, some give the characteristic indol reaction of the cholera organism, others less decidedly so, while a few failed to show any indol production. The form of the colony in gelatin plates is also variable. Some show the characteristic concentric arrangement of the cholera organism, while others deviate from it in several minor particulars. In the same manner the growth in all the different culture media varies with the different organisms; for instance, an organism may vary from the cholera group in only one particular, others in two or more particulars. Several organisms may show similarity in one or two particulars and deviate from the type in others, while other organisms show deviation from the type as to the former particulars and conformity as to the latter. When studied in detail the whole class of organisms appear to have originated from one or several ancestors and, from long continued separate existence under different conditions, they have developed this irregular form of deviation from the original types.

When all the known characters of these organisms are taken into consideration with the idea of classifying them into groups we are met with insurmountable difficulties. When grouped according to one or other of their peculiarities we are able to arrange them into several different groups, but according to which of their peculiarities is taken as the basis for classification, we find that only a limited number always fall into the same group. Indeed, our present knowledge gives us no measure by which they can be grouped systematically.

The characters which have been taken as a basis for classification are the following: Morphology, pathogenesis, indol production, form of colonies in gelatin plates, growth on blood serum, growth in litmus milk and the reaction produced on the organisms by the serum of an animal immune against one or the other of the most prominent types of the organisms.

A large number of the organisms found possess distinctly pathogenic properties for pigeons and guinea pigs. When quite small doses are inoculated the animal usually recovers and possesses a certain degree of immunity. The form of immunity conferred is closely allied, if not identical with that resulting from inoculation of the cholera organism. For this reason it is very difficult to produce absolute immunity. An animal may recover from quite large doses of a virulent spirillum and later succumb to a smaller dose. Many of the organisms were found to be but feebly pathogenic, or even non-pathogenic. The immunity conferred by one type of organism was found to be protective against large doses of another type of organism. This is in accordance with what Dr. Abbott has found with regard to the immunity conferred by the vibrio Schuylkillensis and that conferred by the vibrio Metchnikoff.

The most important point with regard to the occurrence of these organisms in the river water around Philadelphia is the fact that similar organisms have been found in the surface waters of European cities in which there had recently been an epidemic of Asiatic cholera, notably at Hamburg and Altona.[2] In this city we have not had any cases of cholera since 1873, and then only a few cases developed. The foremost bacteriologists of Europe have been inclined to the opinion that the organisms which they found in the surface waters of European cities were the remains

of the true cholera organism, and that the deviations in the morphologic and biologic characters from those of the cholera organism were brought about by their prolonged existence in the water. No such explanation of the occurrence of the organisms in Philadelphia waters can be given. However, their distinctly pathogenic properties for the lower animals leads one to assume that they are not without significance. What their real significance is has not yet been determined.

The fact of the occurrence of these organisms in our surface waters at a time when there has been no outbreak of Asiatic cholera for many years, is of the utmost importance. Had these organisms been discovered subsequent to an outbreak of cholera, or at the time of a cholera scare, it is evident that their significance would have been looked upon as quite different.

It is most desirable that the surface waters of other American cities should be studied in order to ascertain whether these organisms are widely distributed. It is also desired to have careful studies made of outbreaks of diarrheal diseases in our cities, with the view of determining whether these organisms bear any causal relations to such diseases.

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THE PHYSICAL AND HYGIENIC CARE OF CHILDREN.

Presented to the Section on State Medicine, at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June 1-4, 1897.

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The physical and hygienic care of children plays a most important part in the domain of medical science. At the present time more care is given to the mental development of children than to their physical education and hygienic surroundings. The cause for this seems to be due to the fact that teachers and parents know little or nothing about physiology, anatomy and hygiene. The knowledge of these subjects is very important and is especially needed by those who are interested and closely connected with pedagogy. If teachers and parents once recognized that as much, if not more, importance should be attached to the physical and hygienic welfare of children we should not see so many weak, delicate and deformed cases.

It is pitiable that the physiques of thousands of children are absolutely neglected, especially when the medical man knows perfectly well that more care in this respect would make a brighter and more active mind.

Parents and school-teachers who are ignorant of the effects of exercise on the circulation of the blood can not possibly understand the benefits of physical work in reference to improving and strengthening the the constitutions of children. They will also be more ignorant of these effects unless they understand the metabolic changes brought about in the different organs and tissues of the body by physical and hygienic conditions.

The physical and hygienic care of children should not be entrusted, as it now is in the vast majority of cases, to a quack, because great harm and severe injury is very likely to be the result. It is just as essential to entrust the physical and hygienic care of a child to a specialist as it is to entrust a surgical operation to the skill of an expert surgeon. The reason so much precaution should be taken is that unless a physician thoroughly understands the effects of physical exercise he is extremely liable to do more harm than good; the result being that physical exercise is condemned when the condemnation should be attributed to the ignorance of the physician. Physical exercise properly prescribed will never be productive of anything but good results and these results are a great benefit to children, especially where the specialist is dealing with a weak, diseased or deformed patient.

It is far better, in cases where it is applicable, to prescribe physical exercise for children than to use a drug because exercise is a natural means of altering, strengthening and developing the different tissues in the body; while drugs are unnatural and employed for the most part to change pathologic to physiologic conditions. There is no safer means of strengthening the constitution of weak and delicate children than by exercise, because by this means every organ and tissue in the body receives new blood and receiving new blood is greatly benefited when auxiliary conditions of diet, sleep, ventilation, clothing, bathing and sunlight are added.

If physicians, who are consulted in reference to the physiques of delicate children, would ask themselves the question, "Am I fitted to prescribe exercise for these children," and then carefully consider the needs of such patients and send them to a specialist, much better results would be obtained. Instead of doing this, these children are sent to a gymnasium, where in the vast majority of cases the instructor knows absolutely nothing about medicine, the results after a time being overwork, disease or deformity. Many physicians have no other idea of a gymnasium than as a place where one can get "some" kind of exercise and, in addition, do not know for what purpose each piece of apparatus has been made.

There is ample reason why a physician who is not a specialist in physical culture is not capable of prescribing physical exercise for his patients. In the first place not being familiar with the different methods of prescribing exercise, he can not tell what kind of exercise to give; secondly not knowing the effects of these exercises he will be absolutely incapacitated to prescribe the proper amount; thirdly he will not be able to recognize the early symptoms of overwork when they manifest themselves; fourthly he will not know how to take and arrange anthropometric measurements; fifthly not observing his patients when they are exercising he will not know whether the proper muscles are used or what the effect upon the heart, lungs and nervous system is. These questions are of prime importance and it would be much safer for the doctor not to prescribe exercise for his patients and then send them to a gymnasium where the above considerations are never taken into account.

On the other hand when a physician sends these children to a specialist it is the duty of the specialist to consult with the physician by whom such patients have been sent and under no conditions should the specialist prescribe a drug of any kind because he will not understand how to prescribe for these patients so intelligently as the family physician.

Some physicians may think it is not necessary for them to possess special knowledge in prescribing physical exercise for their patients; but no one will assume for a moment that he is worthy to be called an ophthalmologist, aurist, gynecologist or surgeon unless he has made an especial study of these branches.

Physical education has had a wonderful growth in the United States in the last decade and it is a pity that few physicians and gymnastic professors (so called) recognize the vast amount of knowledge required to fit one to be a specialist in physical culture. The benefits resulting from physical exercise correctly applied are beyond measure, and the tonic effect is much better than that of drugs. The specialist in physical culture should know the effects of every kind of exercise he prescribes, *i. e.*, whether the nervous system is to be affected chiefly or whether the muscular system, the respiratory apparatus or the bony framework is the part called upon to perform the major part of the work.

In addition the hygienic surroundings of children should be most carefully observed, and everything pertaining to their improvement should be most rigidly carried out.

Diet plays no small part in this respect and the food should be most nutritious, and easily digested. Under no conditions should any food be prescribed that will in any way tax the digestive functions; and in many cases the physician must insist that the diet shall consist of nothing but milk. Physical results are ofren negative when diet is overlooked, because the gastro-intestinal canal does not perform the digestive functions properly and the patient instead of being benefited by his exercise, as he should be, finds that disease, as for example dyspepsia, is the result. Care should be exercised by the specialist in physical culture in allowing a sufficient time to elapse, in these cases, between the time food is taken and the period at which exercise begins.

If exercise be indulged in too soon after eating, great injury may result because the digestive organs will not receive an amount of blood sufficient to supply the process of digestion completely, the result being that the food is incompletely oxidized in consequence of which many diseases arise.

Bathing is also very essential in reference to the hygienic care of children. Baths of one sort or another are productive of good or bad results according to the intelligence with which they are prescribed. There are few children for whom exactly the same kind of a bath may be prescribed. Their constitutions differ so widely that it is necessary when prescribing a bath to inquire very closely into their family history and regulate the kind and temperature of the bath accordingly.

It is also important to regulate the number of baths. In most cases one bath a day will be sufficient, yet in some cases a bath every other day or twice a week will suffice. The time spent in bathing is a a factor needing the closest attention, because if these children are allowed to bathe or be bathed regardless of the length of time a chill, depression or shock, may be the result, and in consequence the nervous system may suffer greatly. The physician who makes a specialty of the physical development of children should be thoroughly posted on all matters pertaining to the different kinds of baths and to the method of prescribing them. A bath wrongly prescribed especially in the case of weak, delicate and diseased children is often as productive of injurious results as a drug given in an overdose.

Strict attention should be paid to the manner in which these children are dressed. Many parents dress their children according to the season of the year, no matter what the temperature of the weather may be, and in so doing a cold results which often leads to some bronchial or pulmonary trouble. If they would dress their children according to the temperature and not according to the season of the year these troubles would not occur.

Massage is another important topic in reference to the physical and hygienic care of children, being one of the best means the physician has for aiding him in the cure of these cases. The doctor should be so conversant with massage that he may prescribe the special kind of rubbing needed for each case. The man who is a masseur and not a doctor needs especially to be guided in rubbing these patients; yet if the physician be ignorant of the different technical ways of using massage how can he prescribe massage intelligently.

SOME OBSERVATIONS ON THE PRINCIPLES INVOLVED IN PROPHYLAXIS OR PREVENTION OF DISEASES IN GENERAL, AND OF PULMONARY TUBERCULOSIS IN PARTICULAR.

Presented to the Section on State Medicine at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

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Prophylaxis or preventive medicine is founded on the supposition that a large proportion of the important diseases that afflict the human race are preventable by judicious measures adopted for the purpose. Such measures must be directed toward the accomplishment of one or more of the following objects: 1. To prevent the development of the specific causes capable of inducing disease. 2. To destroy or neutralize such causes after they are developed and before they had excited active symptoms of disease. 3. To so increase the natural vital resistence of the living body that it successfully resists the action of the supposed causes of any form of disease; and 4, to interrupt contact or communication of the sick with the well. To be successful in the accomplishment of these important objects we must have reliable knowledge of the causes that produce disease, or at least the conditions and laws under which they are produced or propagated, and the vital or metabolic processes by which they are destroyed or expelled from the living body.

It has long been known that one group or class of specific causes of disease is developed only in the animal body while under the influence of the same causes. Such are the causes of the class of acute eruptive fevers, variola, varicella, scarlatina, rubeola, etc. Being evolved only in the bodies of the sick and eliminated through the various excretory processes in sufficient quantity to poison the immediate surrounding air and thereby communicate from individual to individual in confined atmosphere or by contact, they are very appropriately called contagious. Fortunately all the diseases arising from this class of causes are strictly self-limited in duration and very rarely attack the same individual more than once.

Another very important class of disease-producing

poisons is developed and propagated outside of the human body, chiefly in connection with organic impurities in the air, soil, water or food, and have until recently been called infections. The important diseases arising from this class of causes are periodic and continued fevers, yellow fever, plague, cholera, and other endemic and epidemic affections, which like the preceding class are self-limited in duration, but not like them self-protective against future attacks. Their propagation does not depend so much on present contact as on the sanitary or insanitary condition of the environment.

The exact difference between a contagious and an infectious disease may be thus illustrated: Though a case of smallpox be placed in a perfectly healthy neighborhood, supplied with pure air, good water and clean soil, the patient would communicate the disease to every individual who came in close contact with him, and had not been previously protected; while if a case of erysipelas, typhoid or yellow fever or cholera be conveyed into such a neighborhood, it would not communicate the disease to a single individual in the new locality, unless the case was confined in an unventilated and unclean room until the confined air became sufficiently impregnated with the excretions to develop new infectious matter. When this has taken place, other persons from a healthy neighborhood coming into such a room and breathing its atmosphere are liable to sicken with the same disease; and many such instances have been quoted as proofs of personal contagion, when they were only foci of infection.

It is in limiting the number and destructive effects of this class of acute diseases by removing the conditions by which the soil, water or air become infectious that sanitary work has conferred its greatest benefits upon mankind. And it is in discovering the individual pathogenic bacteria and their ptomains or toxalbumins in each infection, and the laws and conditions under which they develop and multiply, that modern chemic and microscopic research has achieved its most important results in adding to the resources of the healing art.

The infections of soil, water, air and household filth have been recognized for centuries, under the names of marsh miasms, idio-miasms, and epidemic constitutions, and many of the laws by which they have been governed. But it remained for the chemists and bacteriologists of the present day to discover, isolate and propagate the active infective agents concerned in many of the diseases of this class. Very naturally, with the discovery of each pathogenic germ and ptomain came first the idea of destroying it by specific medication, and we speedily became overwhelmed with antiseptics, germicides and antitoxins with which to fight the noxious agents after they were already doing their destructive work in the blood or tissues of the living body. Experience however, is fast demonstrating that this is commencing the fight too late to achieve the most important results: for when the pathogenic germs and toxins have already pervaded the system and established their morbid process, the administration of germicides and antitoxins is found to exert but a limited control over the progress of the disease, and does nothing toward removing the insanitary conditions of the soil, the water, the air and the household want of ventilation and cleanliness.

On the contrary, so far as the sanitarians have directed their efforts intelligently against the contamination of the waters and soils of any country by excretory filth and decomposable vegetable and animal matter, and have enforced such domestic regulations as secured to the people personal and household cleanliness and free ventilation with pure air and good light, just so far have they destroyed the sources of infection, and lessened the prevalence and mortality from the whole class of infectious diseases. If any illustration of this is needed, we have only to compare England, with her sanitary officers in all her seaport cities, and even country districts, constantly waging a warfare against every species of water and soil contamination, and enforcing household cleanliness and ventilation, and year after year boldly defying the inroads of cholera, yellow fever, plague and other infectious diseases, without a recognized quarantine station on any part of her coasts, with her colonies in Asia, where almost every river, watercourse and well is so contaminated with filth that the greater part of the population may be said to eat, drink aud even inhale their own excretions, and as a consequence the cholera, typhus, yellow fever and plague continue their destructive visitation from year to year.

A Haffkin with his anti-cholera vaccination may prevent a few thousand cases of cholera when an epidemic is prevailing, but he must repeat the same every year or at every return of the disease, so long as he does nothing to remove the sources of the infection. But let the soil and waters of India be purified and their future contamination guarded against with the same vigilance as they are in England, and they would have no further use for either anti-cholera vaccin or anti-plague serum.

Yet the chemists and bacteriologists are almost certain to call every toxic and pathogenic germ with which they are able to produce a disease by injection or inoculation a contagion, and the sanitarian readily falls into the same habit and calls every disease so produced *contagious*. It is on this line of investigation that the bacillus tuberculosis was discovered, and its reproduction in the sputum of the patients, and the idea of the *contagiousness* of phthisis was revived and proposed as the chief basis on which to found measures of prevention, by officially declaring the disease to be contagious and to be reported by physicians to the health authorities, as in the well known acute contagious and infectious diseases. But the wide disparity between the clinical history of the acute, self-limited, infectious diseases with the well-defined beginnings and terminations, and that of pulmonary tuberculosis or any other form of tubercular disease, with its obscure beginning, its duration through months and years, and its already diffusion in almost every township in Christendom, should cause every true sanitarian to hesitate long enough to scrutinize all sides of the subject before he decides to put smallpox, typhoid fever, cholera and tuberculosis under one and the same designation—*contagious*.

As previously remarked, one of the most important errors now common to both bacteriologists and sanitarians, is that of calling every disease *contagious* as soon as a specific germ is identified with its progress, and then directing their chief sanitary or preventive efforts toward the destruction of the germ. There is, however, a clear and very important practical distinction between the contagion that propagates acute disease wherever and whenever it comes in contact with an unprotected individual, and the specific microbes classified by M. Jaccoud (*Sem. Méd.*, January, 1897),

as etiologic dualisms, because they may exist in a healthy organism without injury to the latter for an indefinite period, and become noxious only in consequence of changes undergone by the organism itself.

The bacillus tuberculosis is the most familiar example of this class. It may be found in the upper air-passage of perfectly healthy individuals, in the air of dwellings, public conveyances, hospitals and in the dust of streets in almost every part of Christendom; and yet it displays its noxious effects in producing pulmonary tuberculosis in only a limited percentage of the population in any country. The only reasonable explanation is that given by Jaccoud when he says that with this class or group of microbes "pathogensis by changes in the organism is the rule, and the traditional etiology based on heredity, congeniality, predisposition, constitution, temperament, or on somatic or cosmic influences retains all its force. These multiple and variable elements are the *true causes* of disease; the microbe is only the instrumental agent."

The truth of this statement is illustrated and confirmed by the clinical experience of the profession in all countries and through all the centuries, as could readily be shown by facts and figures, if time and space would permit. The truth is that the leucocytes and other elements of vital resistance in strictly healthy human bodies, surrounded by fairly good sanitary conditions, completely resist the influence of all the bacilli of tuberculosis to be found in the air or the dust, as the history of the Brompton Hospital for consumptives, and other hospitals in which tuberculous patients in every stage of advancement have been admitted and treated, clearly show. It is only when the natural vital resistance of the healthy living body has been impaired by persistent depressing mental influences, such as anxiety, despondency or grief, or by living in overcrowded, ill-ventilated houses on damp soils; or by insufficient food, clothing, and open air exercise; or by the use of alcoholic drinks and other anesthetic and narcotic drugs; or by prior attacks of other severe disease; or even hereditary defects of organization, that the tubercle bacillus is able to develop its destructive effects on the human subject. If this is true, the leading practicable principle of prevention is so to instruct the people that the various causes of vital impairment enumerated may be avoided.

To publicly declare tuberculosis a *contagious* disease, and require physicians to report to the health boards every case, with isolation of advanced cases, would deter large numbers from consulting a physician in the early stages of their disease, through fear of thus being reported; it would add greatly to the anxiety and despondency in families where a suspected case might exist, and would equally add to the difficulty of finding employment for such; and it would speedily lead to the erection of legal barriers in the way of changes in climate, thereby compelling the unfortunate consumptive, like the leper, to abide either in the isolation hospital or some colony on a strip of the public domain set apart for that purpose. In a word, it would be going back to repeat the sanitary treatment of consumptives practiced in Italy and Spain during the first quarter of the present century, and with very similar results.

Instead of thus directly adding to the fears, anxieties and miseries of all classes of the people, our sanitary authorities should with increased vigor, continue their work of enforcing everywhere cleanliness, house ventilation, soil drainage, pure water, wholesome food and the discontinuance of the use of all varieties of alcoholic and other anesthetic drinks, which so invariably diminish nerve sensibility and vital resistance to morbid agencies. In so doing they will accomplish vastly more in limiting the spread or prevalence of tubercular consumption than by all other agencies combined. It is to work in these directions that we owe whatever improvement in the ratio of mortality which has taken place during the present century. Indeed, if we could effectually stop the use of all varieties of alcoholic drinks, and thereby do away with their depressing and paralyzing influence on the vital processes in living matter, with the poverty and mental wretchedness that ever accompanies their habitual use, before the end of the first quarter of the incoming century the prevalence and mortality from tubercular disease would have been diminished more than one-half.

PRESENT STATUS OF INOCULATION AGAINST YELLOW FEVER.

Presented to the Section on State Medicine, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

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The attention of the medical profession has been called anew to the preventive treatment of yellow fever by the claim of Giuseppe Sanarelli to have discovered its germ.

We find in the *Medical News* (January 27) the following notice: "A cable dispatch from Rio de Janeiro to the *London Times* states that a young Italian, Giuseppe Sanarelli by name, has undoubtedly discovered the yellow fever germ. Sanarelli is the director of the Uruguayan National Institute of Experimental Hygiene, and a follower of Pasteur. He is said to have sent an account of his discovery under seal to the Academy of Medicine at Rome."

There appears also in the *Medical Record* (April 24, 1897), the following allusion to this supposed discovery: "The Rome correspondent of the *Lancet* writes that Dr. Giuseppe Sanarelli, who believes that he has discovered the bacillus of yellow fever, as well as a remedy for the disease, has embodied his researches in a monograph which has for some time been in the possession of the Academia Medica di Roma, that body being thus empowered to protect his claim to priority should that claim in the interval have been challenged. The supplementary studies by which he has sought to check the laboratory and clinical work leading up to his discovery are now completed, and the whole series, including the substance of the monograph aforesaid, will be published in three successive numbers of the *Annali dell' Instituto Pasteur*. Coincidently with the appearance of the first of these fasciculi, that is, within a few weeks' time, he will deliver before the Montevidean Society of Medicine a lecture, accompanied by illustrative preparations, in which the nature of his discovery and the successive stages by which it was arrived at will be fully set forth."

In connection with these announcements, I would ask attention to the following paragraph in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, headed "Prophylaxis of Yellow Fever in Brazil": "The disease was kept under control and stamped out in Buenos Ayres by the immediate removal of

every case, as it appeared, to the floating hospital, while all the other inmates of the house were taken at the same time to the island quarantine station, where they remained until all danger was past. The house was submitted to a vigorous disinfection during the entire time of their absence, and as a final measure, all the walls were calcimined. The physician first called to the case was also quarantined in his own house for the same length of time, and the premises disinfected. By these measures the disease was restricted to a few isolated cases in the early spring. Dr. A. Simoes proclaims in the *Rev. med. chir.* of Brazil the success of inoculations with attenuated cultures of the yellow fever microbe, the micrococcus xanthogenicus discovered by Freire in 1880. Since he was authorized in 1883 by the government to administer them, 11,881 persons have been inoculated, and he states that the mortality among them has been only 0.5 per cent., while among the rest of the population it has averaged 30 per cent. The yellow fever hospital had a mortality of 78 per cent. until the inoculations were introduced, when it fell to 30 per cent. He adds that if all the strangers recently arrived and all persons exposed to contagion would have themselves inoculated epidemics would cease and there would be only a few sporadic cases, while vigorous hygienic and disinfecting measures in addition would exterminate the pest altogether. —*Cronica Medica*, October 15."

To enable those who may not have noted the progressive steps in yellow fever inoculation it is proper to state that in 1885 I drew the attention of Dr. Joseph Holt of New Orleans to the great practical importance of this matter; and as president and representative of the Louisiana State Board of Health he presented a memorial from the New Orleans Cotton Exchange to the American Public Health Association, to appoint a commission to investigate the discovery by Domingos Freire of a method for the prevention of yellow fever.

In connection with the discussion of this proposition in the *New Orleans Medical and Surgical Journal* the editor said: "It is our conviction that a few months will see Freire and his researches consigned to that lunar limbo where are laid away all things lost or forgotten here on earth."

But it appears that Freire, like Banquo's ghost, will not down and after seventeen years the work goes on successfully in Brazil, and the Argentine Republic may well profit by the latter's example instead of trusting to quarantine and disinfection alone. It is to be hoped that Sanarelli will be as successful in Uruguay as Freire and Simoes have been in Brazil.

I subsequently presented a memorial to Congress from the AMERICAN MEDICAL ASSOCIATION and it was favorably considered, but upon getting the sanction of the ASSOCIATION at its next meeting for sending two additional commissioners to assist Dr. Sternberg with his work in Brazil and Mexico, Dr. J. B. Hamilton managed to have the resolution rescinded. The same gentleman, as chairman of the Section on State Medicine at the 1890 meeting in Nashville, initiated steps to put a quietus to further investigation of the prophylactic inoculation of Freire against yellow fever, and with him and Dr. Sternberg rests the responsibility of the failure to secure its advantages in this country. It is hoped that the influence of these prominent members of the profession may yet be counted in the interest of yellow fever inoculation. Great would have been the necessity for all precautions in view of the recent outbreak of yellow fever in Cuba and of the close relations of this island with Key West and Tampa, Fla., during the present civil war for Cuba's rights, not to speak of past epidemics at Brunswick, Jacksonville and New Orleans. At the meeting of the quarantine conference in Montgomery. Ala., in 1889, I claimed that as germaine to the objects of the quarantine conference yellow fever inoculation should be accorded the place of the most radical means of prevention known and that if it accomplished anything it accomplished everything.

In an article which appeared in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (March 22, 1890), it was urged as a fact versus fiction. Again, as late as Dec. 8, 1894, I wrote for the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION the conclusions which had been formed in September, 1894, in the International Congress of Hygiene and Demography, assembled at Buda-Pesth, Hungary. This Congress announced its belief in the discovery of Freire as follows: "It is a fact attained for science, thanks to the labors of Prof. Domingos Freire, supported by many physicians of Brazil and by observers of other countries, that a microbe (*cryptococcus xanthogenicus Freire ou bacteria de le Dantec*) is the active cause of yellow fever."

From Dr. Sternberg's instructive and interesting description of the observations made by himself and others, it is inferred that the germs or bacteria presented by Freire, Carmona, Gibier, Findlay and others are not to be regarded as identified uniformly in connection with yellow fever, so that the yellow fever bacillus has yet to be discovered. It is most probable that the views of Dr. Vaughan in regard to certain diseases being developed by ptomains after the death of bacteria in the different structures, may be the key to explain the phenomena of yellow fever. All are aware that in the case of hydatids, the chief element of disorder is their death, and hence it would seem that the most philosophic investigation, after the progressive changes in yellow fever have resulted fatally, should not detect living bacteria in the structures of the body, but that they should be sought in the fluids or secretions of the subject of yellow fever in its early stages.

Facts are stubborn things, and as in medicine we use many remedies empirically, without having any rational explanation of their *modus operandi*, we are called upon to test the prophylactic virtues of yellow fever inoculation without having a truly scientific clue to its efficacy. If it appears that inoculation in any form or with any substance, be it a bacillus or not, prevents or modifies the progress of yellow fever in human beings, we are warranted in resorting to it to secure our people against the ravages of this disease. It is claimed that such a process has been employed with satisfactory results in Rio de Janeiro by Dr. Domingos Freire, and the results have been tabulated, giving the names and location of those inoculated, reaching above seven thousand individuals, subject to the scrutiny of interested observers, before 1889. The deaths among all those subjected to this process have not exceeded one to the thousand, while the percentage of deaths among those attacked with yellow fever in the same localities has far exceeded this proportion, being one in one hundred. Under such circumstances we must either disprove the statistics or accept the results as conclusive. Dr. H. M. Lane, a

former resident of Carthage, Mo., and now at the head of one of the largest educational institutions in Brazil, situated at San Paulo, was inoculated in 1886. He gave his report (JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Vol. VII, p. 165) in a paper on "Yellow Fever in Brazil." He was then a resident of Rio de Janeiro, Brazil, and had every opportunity for judging of the merits of inoculation. He had no great disturbance of the vital functions from inoculation, and has remained immune. The statistics of vaccination have never been questioned because the disease has never been explained by the culture of a microbe associated constantly with the disease, and recent studies presented to the consideration of the American Association of Physicians have failed to isolate the cause of variola.

The views of an editorial which appeared in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION some years ago, made this very point with reference to yellow fever inoculation and the studies that have been made by Freire and Findlay. The mosquito was shown by the latter to have inoculated the virus of yellow fever, and the more frequent number of inoculations caused a gradual attenuation of the virus. The people thus bitten were affected with yellow fever in a mild form. The idea of Freire is a similar one, but he cultivates the virus in the laboratory in such a way that he secures the prophylactic influence without the serious consequences of yellow fever.

When Jenner introduced vaccination, more than a century ago, the presumption against his process was stronger than that which exists at the present day against yellow fever inoculation, and it was necessary to determine by actual demonstration that the modified impression produced by vaccination really gave immunity from any serious effects of variola.

This running comment may serve somewhat as an introduction to the forcible words of the editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Jan. 11, 1890), and already epitomized. "And apropos of inoculations, the press of the country has again referred to the inoculations practiced at Rio de Janeiro, stating that the City Council of that city has been so favorably impressed by their ascertained value as protecting against yellow fever, that $600 a month has been voted for vaccinal establishments. To us, at a distance, it seems that the reasoning of Dr. Domingos Freire of Rio de Janeiro, Brazil, Dr. L. Girerd, late of Panama, and Drs. Carlos Findlay and Delgado of Havana, is sound and based on the reasoning applied to vaccination. From a case of specific yellow fever, blood is taken from the finger and a culture is made. The attenuated culture is used for inoculating. Natural result, a mild yellow fever, or planting corn that they may get corn, to use a homely simile. Dr. L. Girerd, while in that hotbed of yellow fever, Panama, inoculated himself and produced a mild yellow fever. In December, 1886, the *Canada Medical Record* published a translation of his paper. In Havana, Cuba, Dr. Carlos Findlay repeatedly has inoculated new arrivals, with the happiest results, *i.e.*, subsequent immunity in that hotbed of yellow fever. Again, 'like produces like.' That the blood of a patient suffering from specific yellow fever must be full of its germs goes without saying. In attenuating it, the cultures made *à la* Pasteur, the gentlemen named have worked on accepted lines. They are well-known writers and investigators, as native and foreign medical literature testifies. They have fixed on certain germs or microbes which, from their constancy in their cultures, they believe to be the specific germs. Many years ago, during a limited epidemic of yellow fever at Southampton, England, Dr. Hassell of that city detected an unknown germ or entity in the blood of his patients. Ziemssen refers to it. But be that as it may, from the blood of yellow fever patients the poison of the disease is obtained.

"To repeat, time, patience and investigation will clear up the minor details; the great ones seem to be indisputable. That yellow fever is due to an entity or germ all students of yellow fever accept."

NOTE.—"At the request of Dr. Freire the government of Brazil has appointed a committee of seven prominent physicians to investigate his claims in regard to the micrococcus xanthogenicus" (JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, July 10, 1897, p. 92).

SURGERY ONE HUNDRED YEARS AGO.

AN HISTORICAL STUDY

BY DR. GEORGE FISCHER.

DEDICATED TO THE GERMAN SURGICAL ASSOCIATION.

TRANSLATED FOR THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION BY CARL H. VON KLEIN, A.M., M.D.

XIV.—INFLAMMATION AND WOUNDS.

(*Continued from page 802.*)

Until within the eighteenth century opinions were divided, and it is surprising that so many surgeons instead of improving the methods of ligature, set themselves, as it were, to disparage its advantages and to discover new means of arresting the flow of blood. They charged against it that the manipulation was cumbersome, the thread insecure and that the coats of the arteries were cut and sometimes nerves were included in the ligature, from which evil consequences arose. Englishmen generally accepted the ligatures, discarded styptics entirely for the large vessels, while the flow from the smaller ones could be stopped by compression. Paré's simple method was again introduced into the English hospitals by White, then by Aikin and used with much success. Sharp, on the contrary, preferred the suture and thought that with the use of pincers the arteries could easily slip out of the ligature. All progress was checked so long as they thought it necessary to include the muscle fibers in the stricture. At that point contention began. Englishmen discarded this method entirely on account of the contraction of the muscles, of the slipping of the thread and of the cutting of the arteries (A. Monro, Gooch, White, Aikin). Bromfield always bound up the artery alone, and invented a curved and pointed hook for the purpose of drawing it up. Alanson and B. Bell likewise favored the ligature of the isolated artery; Bell furthermore considered the procedure so easy and reliable that it was foolish even to think of any other method and rash to trust the large vessels to any other means when the ligature was so simple and could be relied on so fully; he furnished the pincers with a slide for closing them. Although an advocate of ligature, Warner said he knew a few cases should be reserved for the hot iron when ligature was impossible. In France the great regard for J. L. Petit retarded the development of ligature; he allowed to the thrombus alone the power to arrest the flow of blood and close the vessel, and saw only one advantage in the ligature, that of holding back the coagulum. As the greatest advocate of direct compression, which best supports the action of the thrombus, he

discarded the ligature in amputations as a cruel method. Its superiority was only gradually conceded, and its general introduction in France is especially due to Desault. With one blade of the pincers in the opening of the artery he seized and bound it with a waxed thread, which he drew only moderately tight and double knotted. (On account of the after-hemorrhage Desault bound the veins also in amputations; he introduced the two blades of the pincers into the openings of the artery and vein if they lay close together, and included them in a common ligature.)

Pouteau, who regarded the swelling of the cellular tissue as the most important factor in stopping hemorrhage, insisted that many muscle fibers be bound with the artery in order to obstruct the blood as much as possible and prevent cutting through the artery. Louis, on the contrary, who feared the quick falling away of the thread, caught as little of the tissue as possible with the artery. Deschamps proved that just this inclusion was the source of many after-hemorrhages, and with Scarpa announced the principle that for ligature the artery must be separated from all other parts, even its cellular tissue. Only with the recognition of this principle was the way opened for the general application of ligature. Those among the German surgeons who were educated in England advocated it earnestly. Richter, Heister and the two Siebolds regarded the ligature of the isolated artery as the most reliable, the safest, gentlest and most harmless means of arresting hemorrhages of the larger arteries. Richter did not fear the cutting through, if the threads were rather broad and not drawn too tight. He recommended Bromfield's hook instead of the suture, which was very popular at that time but appeared to him inconvenient, and instead of the artery pincers, which he discarded because they seized nerves and muscle fibers with the artery. (In 1753 von Brunn in Göttingen had from his investigations upon animals by binding the larger nerves, to which the severest accidents happen, enunciated the theory that in ligature of the arteries the nerves should never be bound with the artery.) He had no confidence in compression or the hot iron, but left the former to hemorrhages of the small vessels, the latter to very deep-lying blood vessels. As a modification of the ligature Scarpa advanced the method of protection to a special principle in which he laid a small strip of linen between the thread and the artery. Previously Deschamps, who objected to the insertion of foreign bodies, had come forward with a new discovery, the "Presse-artère" (1793); he took a small silver staff with a head set at right angles and doubly perforated. Between this and the thread, the end of which was passed through the two perforations and knotted in the cleft in the upper part of the staff he squeezed the artery. The fear of hemorrhages from this time on constantly diminished. The large arteries were boldly encountered. Petit, Deschamps, Ehrlich and others laid bare the injured art. cruralis and bound it. Acrel, in a case of traumatic aneurysm, successfully placed a ligature on this artery a few inches under the lig. Poupartii, and indeed Desault in aneurysm of the axillaris undertook an operation which hitherto, out of fear of a hemorrhage, had been performed only two or three times. He failed at this as he could not stop the flow of blood, and his patient died suddenly. In the year 1775 the carotis communis was for the first time bound by Warner and Else, following which Lynn, J. Hunter's assistant, in 1792 achieved the same result in a violent hemorrhage after the extirpation of the parotis. The ligature of the carotis externa was, as B. Bell relates, first performed in 1786 in a hemorrhage attending extirpation of a scirrhous tumor. Abernethy followed in 1796 with the binding up of the iliaca externa.

Next to the ligature, *compression* was the principal means for stopping hemorrhage. For this purpose the tourniquet was used, which had been invented by Morel in 1674, and which J. L. Petit had improved in 1718 by adding a screw for the drawing on of the girdle. This instrument was endlessly modified. Among the Germans Ehrlich invented a pad having a crosspiece with a handle for the purpose of compression; Brünnnighausen and Hesselbach invented an iron hoop with a handle. Indirect digital compression, already known to A. Paré, found an advocate in the eighteenth century in Louis, who recommended it in amputations. Bromfield compressed the subclavia against the clavicle with the finger, and Richter in the most critical cases used the thumb in place of the tourniquet. A few German surgeons who would have nothing to do with ligature, employed compression in the form of the tampon, which was preferred by J. L. Petit to all other methods for stopping hemorrhage. Theden used a lance for this purpose. He had at first used the ligature in amputations, but never the detested ("vermaladeyeten") artery pincers—"my flesh creeps when I think of the notorious artery pincers"—because he saw contusion of the arteries and spasms of the nerves, swoons and great pain resulting from their use. He repeatedly asserted that he was able to stop every arterial hemorrhage in the extremities, even in case of the cruralis and axillaris, with the tampon, and in many violent hemorrhages he found no ligature necessary. He considered the successes of the English as of no value. When in 1745, after an amputation of the upper arm, he wished to constrict the artery, he pulled it violently back and the bleeding ceased, whereon he concluded that this drawing back action could be accomplished by the tampon, and the bleeding thus stopped. After a few successful amputations he discarded the ligature entirely, not even approving of it for after-hemorrhages. His practice was to place finely picked lint in balls about the size of a hazelnut, at the opening of every bleeding artery, and to constantly increase the size of the balls of lint so that altogether they represented the form of an inverted cone; besides this, on both sides of the stump compression was exerted which increased the pressure upon the arteries. The pressure bandage, finished with a maltese cross, long narrow compresses and bandage, was moistened with arquebusade water. In case of possible transportation of the patient he had a fresh ox bladder fitted over this bandage, in order to prevent renewed hemorrhage. This method of stopping hemorrhage he applied to all operations. His influence had the effect that in the Berlin schools, needle and thread for fastening blood vessels were discarded, as well as the artery pincers. In the fifty years of rich practical experience following the first experiments, this method proved itself so valuable that in 1795 Theden wrote: "I have performed this operation in this way when it was quite necessary, and up to this hour with the very best success." The same opinion was held by Schmucker, who, moreover, considered tamponning by means of fine lint as altogether safer for the cruralis, and in amputations regarded it better than ligature, because

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of the painfulness of the latter. The two surgeons-general had become acquainted with the tampon through a city surgeon in Schweidnitz and had introduced it since 1744. Bilguer took a middle course and while for hemorrhages of the larger blood vessels he applied ligature to the isolated artery by means of pincers or a clasp, on the other hand, in the case of small blood vessels, he applied the tampon by means of a sponge and lint. With such recommendations one can readily picture the great disadvantages which resulted from the tampon in Germany, especially in military surgery. That Theden had no reason whatever to be satisfied with his results was demonstrated to him by A. F. Vogel. The latter saw five healed amputations of the upper thigh in London at one time, while Theden could only boast of two recoveries in all after this operation, which he had certainly often performed, whereupon Vogel declared that the great variance between the German and English results was because the German surgeons had discarded the ligature and arrested hemorrhages by compression and constriction of the stump.

Some surgeons applied the ligature only in case of the cruralis, and for the other arteries employed stricture and *styptics*. Indeed, the latter were so much in vogue that among the German barber-surgeons, especially in the first half of the century, almost nothing but this was talked of, aside from the hot iron. In later times also they were very much used by the best surgeons for arresting hemorrhages of the small blood vessels. Among the great number of them (vinegar, alum, vitriol, colophonium and others) the common wash sponge was very popular. Charles White arrested every hemorrhage with it, and in fifty cases of arterial injury, among them amputations of the upper thigh and of the mammæ, he required the ligature only twice. J. Bell considered it as the only rival of the ligature. A great sensation was made by the oak fungus, *agaricus*. Brossard, in 1751, had recommended this as the best remedy in amputations and for this had received a gift from the king of France. The Académie de Chirurgie had expressed a very favorable opinion of it and published the remedy after Faget and Morand had performed a successful operation with it in the presence of la Martinière. Agaricus spread quickly over European surgery and appeared to be about to supersede the ligature. Its warmest defenders were Faget and Morand, who argued as an especial feature of this "amadou" that it could be applied by any of the laity and only needed to be pressed upon the opening of the artery in order to effect a closure. The aged Moreau also preferred it because he observed that the pulse often returned after twenty-four hours, while, on the contrary, after the ligature it remained imperceptible for fourteen days. In Italy the agaricus was championed by Molinelli, and in England by Watson and Warner. The latter had, upon suggestion of the Royal Society in London, experimented with it and discovered that the agaricus arrested hemorrhage more certainly, caused less wound fever and did not retard healing so much as the ligature; it was insufficient, however, in case of injury to the large blood vessels. H. Parker opposed these indorsements (1755) and warned the surgeons; those operated upon by Faget had indeed died and Warner's patients had been so weak that even dust or flour might have stopped the flow of blood. To him the ligature was indispensable, was without danger, and the oak fungus was to be used only where ligature was impossible. Le Cat, Gooch, B. Bell and Acrel declared themselves in the same manner opposed to it. Richter denied to that agent all power of arresting hemorrhage; the arrest of the flow was caused by the simultaneous compression and not by the agaricus, for without the former the latter had no virtue and could be readily counteracted by the movements of the patient. His pupil, A. F. Vogel, held the same views. On the other hand, Theden preferred the new remedy to his hitherto used tampon with lint, and with it arrested hemorrhages of the art. mammaria, of branches of the carotis ext. and cruralis, as well as in castration. At the close of the century *cold water* for hemorrhage was introduced, especially by the Austrian surgeons Zeller and von Kern; they sought to arrest hemorrhages by cold poultices and suffusions or by a bath sponge saturated with ice-water.

Let us leave open wounds in order to contemplate the *precursors of subcutaneous surgery* a century ago. The first impetus to the subcutaneous idea had its birth in 1767 amid the clangor of music. It was J. Hunter who at a dance lacerated the tendon of Achilles and undertook a number of experiments in order to study the reuniting of the lacerated tendon. In dogs he severed the tendon of Achilles subcutaneously with a cataract needle, and in the sections observed the reuniting of the tendon taking place in the same manner as in a simple bone fracture. The principle of the exclusion of the air by means of displacement of the skin found its first practical application in the operation on the joints. Theden indeed already knew that one could open the kneecap without danger if the penetration of the air was only prevented; but when he had opened a suppurated knee joint he did nothing else than close the opening with a plaster, undoubtedly with success (1771). Bromfield for the first time, in 1773, in the extraction of a foreign body from the knee joint introduced displacement of the skin. He did this often with successful results, but did not consider it entirely without danger; indeed, B. Bell sometimes in this affection found amputation necessary. If the foreign body was located on one side of the patella, Bromfield had the skin drawn down as much as possible over the knee and tightly stretched; then he opened the skin and capsule upon the swelling, extracted the foreign body and immediately drew the skin back again toward the thigh. Compresses wet with brandy were laid upon the wound (another assistant should draw down the integuments with his hands till they form rugæ below the knee. . . Extension . . . This effected, the integuments are immediately to be drawn upward. "Chir. Observ.," I, p. 334). This displacement of the skin from above (B. Bell) or from below, in such a way that the opening in it should not correspond with the opening in the capsule, was considered by the English as the essential thing. Hunter, who had many times performed the above mentioned operation with success, laid great stress on the prevention of inflammation and the attainment of *prima intentio*, and therefore, when he closed the wound by suture, he never allowed the latter to penetrate into the hollow of the joint. In Germany Richter first grasped the subcutaneous idea and applied it (1782) in operations on the ganglia. If the sac could not be burst open a very small perforation was made before the lancet was used and the external skin was drawn aside as much as possible, so that it afterward covered the

opening of the sac, and thus the admission of air was very carefully prevented. Then Richter endeavored to heal the wound by *prima intentio*. In the same manner he endeavored to avoid admission of air to the knee joint in the extraction of foreign bodies, in which he was opposed by some of his countrymen (Theden, Mohrenheim, Sulzer and Löffler, in case of the elbow joint); however, they attained successful results. In France, Desault (1791) performed the first extractions from the knee joint, when more than ten operations had been made known and, indeed, five with success and without any danger. Thereupon he asserted that the operation could be undertaken with entire confidence if the admission of air into the cavity of the joint could be avoided by displacement of the skin. This operation was often performed at that time and with happy results.

XV.—DISEASES OF THE BONES, JOINTS AND MUSCLES.

Fractures, Caries, Malum Pottii; Necrosis; Osteomyelitis, abscess of the bones, exostosis; Luxations; Coxitis; Tumor albus; Hydrarthrosis; Loose bodies in joints; Joint neuralgia; Sprains of the muscles; Rupture of the tendon of Achilles; Caput obstipum; Orthopedia; Venel; Club-foot.

Nothing is easier than the treatment of a broken bone or a dislocation! So they had thought for a long time in the last century, and they left both to the quacks, who everywhere proceeded according to the old custom. This was shown by the many crippled and stiff limbs that one saw every day in the streets. How melancholy the outloook with us was is shown by a glance into Henckel's book, one of the first German monographs on bone fractures and dislocations (1759). Leaving out of account the fact that this was based entirely upon French works and is rich in antiquated material, the achievements of German surgery could not be more fittingly characterized than in the words of the author: "It is not easy to say anything new on those two subjects." Then followed the works of Simon Pallas ("Prakt. Anleitung die Knochenkranheiten zu heilen," 1770) and of J. F. Böttcher, ("Abh. von den Krankh. der Knochen, Knorpel und Sehnen," 3 Thle. 1781–93), almost the only works in Germany which treated fractures exhaustively. The whole of German literature did not possess a single exhaustive monograph on luxations. Nowhere an epoch-making advance; our countrymen added to the accomplishments of foreign nations nothing more than a few new bandages. In the first half of the century the Frenchmen Verduc, Duverney and J. L. Petit had taken up fractures and luxations, and the two last named had furnished the first accurate descriptions of bone diseases; so in the second half of the century the reform began in England with Percival Pott ("Some Remarks on Fractures and Dislocations," 1765-68), which was followed by Kirkland's work ("Obs. upon Mr. Pott's General Remarks on Fractures," 1770; Appendix, 1771) and Aitken's work ("Essay on Fractures and Luxations," 1790). In France the advancement of this period was dependent upon Desault.

We will begin with *fractures*. Exaggerated value was placed upon Camper's teaching that there were no real transverse fractures but they were always more or less oblique. To this Richter replied that, in practice, it was indeed a matter of indifference whether the fracture crossed the axis of the bone exactly at right angles or almost so. *Longitudinal fractures* gave rise to a great deal of controversy. For centuries, F. Würtz, with his description of "Kleckbruchs" had passed as the best authority on longitudinal fractures, but without justification, since what he described was nothing else than bone fissure, the possibility of which was for a long time contested. While Duverney cited isolated and untenable cases in support of the possibility of longitudinal fracture, J. L. Petit and Louis denied its occurrence most decidedly. An observation by Gädecke, a German, on the tibia ("Schmucker's Verm. Chir. Schr.," 1, 1776), established the possibility of this fracture somewhat firmly, for which B. Bell also now declared himself. We have also to thank German labor for the first scientific knowledge of *separation of epiphysis*. J. L. Petit had already observed (1741) in case of scurvy, a spontaneous separation of epiphysis, but Reichel first decisively demonstrated ("Diss. de epiphsium ab ossium diaphysi deductione," 1759) that this could originate spontaneously after rhachitis, scurvy, syphilis, measles and smallpox as well as after injuries, and in that case could be easily confounded with fractures or dislocations. He firmly established their diagnosis and provided notes and drawings. Aitken and Böttcher also gave attention to this fracture but without achieving anything essentially new. B. Bell realized the influence of *dyscrasias*, and in syphilis often observed fractures to originate through the simple working of the muscles, and indeed observed fractures that had long been healed again loosened when the patient was afflicted with scurvy. As to diagnosis there could only be premised the wise precept of Richter, which I have taken from a college note-book of C. F. Stromeyer, access to which was kindly given me; it was never to produce crepitation if other sure symptoms were already present, to determine a fracture.

Views of the progress of healing were modified by du Hamel's numerous experiments with *callus formation*. Ant. de Heide, the first experimenter in fractures, had demonstrated (1686), contrary to the teaching of antiquity, to the effect that the callus was an inorganic mass, that it consisted of real bone substance. As to the manner of its origin opinions differed. Du Hamel asserted (1741) that the callus was not produced from the end of the bone or from the cartilage, but from the periostium, which thickened around the fragments and then acquired the consistency of cartilage and at last of bone. Haller contested this opinion and presumed the callus to arise from a bone fluid exuded from the vessels. Troja, in Naples, took up the experiments anew (1775). He also opposed du Hamel, denied this activity to the periostium and, instead thereof, asserted that the ends of the two bones were glued together by a gelatin which exuded from the marrow and formed the material of the future callus. In the same year Callisen maintained that the callus exuded from the ends of the bones (just as Böttcher), that the blood vessels of both fragments of bone tended to come into contact with each other and that therefore the size of the callus always stood in direct relation to the distance between the ends of the bone. All fractures with the exception of that of the patella could be cured by nature in this way. Those views were again opposed by Bonn, who (1783) stated that the callus was new and sensitive flesh, full of vessels, and grew out of the bone as granulation grows out of wounds and sores. It covered not only the fragments in fractures, but also, in amputations, encased the sawed surface, and, after trepanning, grew up out of the dura mater and bone walls. This fresh callus might grow like the granula-

tion fungus, but is never cartilaginous, and as a rule is denser than the ordinary bone, almost as much so as ivory. Finally, at the close of the century, J. Hunter cured simple bone fractures just as wounds of the soft parts, through adhesive inflammation. The space between the two fragments fills with blood of which the red part is absorbed while the coagulable lymph remains behind; into this the blood vessels extend themselves and earthy constituents are supplied, through which the callus arises. According to his view the progress of simple fractures was so much the more favorable because they were "not exposed," *i. e.*, they were subcutaneous.

There prevailed the universal abuse in the *treatment of fractures*, of undertaking their setting in a fully extended position, whereby the muscles were drawn very tense. The result was that frequently the extension resulted badly and apparatus had to be employed to assist. Indeed, Fabriz v. Aquapendente had already recommended a slightly bended position during the setting and after-treatment, but this was first established as a principle by Pott. For transportation of such patients this surgeon considered a detached door as most suitable and laid the greatest stress on the necessity of having the muscles relaxed during the setting, consequently the broken limb must be slightly flexed. Only in the bended position could the setting succeed readily and cause little pain, and it is often otherwise impossible. In simple fractures the bandage was immediately applied and not, according to the old custom, delayed until the ninth day; but, on the other hand, in the case of strongly contracted muscles and violent inflammation, the setting was postponed until the inflammation subsided and the limb could lie stretched at length (Petit, Heister, Bromfield and Richter). Pott demonstrated, however, that it was just the continual tension of the muscles which maintained the inflammation and therefore advised an immediate setting in spite of the inflammation; in general he established the maxim that a fracture could never be set too quickly. There was a contest over the question whether the extension should be undertaken at the end of the broken bone (Petit) or at the next bone (Desault and Böttcher).

A second deep-rooted abuse consisted in enveloping every simple fracture with two or three long, circular bandages. In this way they would adjust the fragments firmly enough to prevent too copious a flow of fluids and the malformation of the callus. Pott discarded these methods because the injured limb must be lifted up and moved, and he maintained that any bandage was bad which could not be opened and removed without making it necessary to raise the limb. The only means of preventing a malformation of callus, upon which the surgeon has no direct control, is to set the fracture well. In simple fractures he preferred the eighteen-headed bandage, which was first mentioned by Verduc and had been a long time in use for complicated fractures. Richter, who especially praised bandages of flannel, agreed with these views.

The *instructions in bandaging*, especially in Germany in the first half of the century, resembled a lumber-room in which some one had carefully collected antiquated rubbish. The Germans eagerly seized the inventions of the French, copied them and originated still more bandages. One can not rightly conceive of the endless kinds of bandages and of their various names, if he does not view the mass of sketches by Heister or Bass ("cf. Kopfbinden bei Schädelfracturen"). In regard to *fracture appliances*, a large part of them had been in use for centuries. The hollow splint was known to Celsus and Galen; Guy de Chauliac applied the straw splint and the extension weight; suspensories, previously suggested by the ancients, were used by Guy de Chauliac and Ravaton, but were first generally introduced by Sauter (1812). The eighteenth century contributed little that was new. They made splints of every possible thing; Gooch had sheepskin glued to thin tables of limewood; la Faye recommended metal; Theden, walnut; Bell and Brünninghausen, leather, etc. Bass considered splints of pasteboard or panel paper as the best, after the straw splint. Since 1748 Sharp had used millboard splints in fractures of the lower thigh, concerning which he made a report to the Royal Society in 1766; the instrument-maker Holmes prepared a number of such splints under Sharp's direction. Bandaging with splints received a real improvement from Pott. They were made too short as a rule, so that they galled and did not hold the limb firmly; Pott ordered that they always extend beyond both joints, and he had them lined with cotton. Bromfield and Aitken did likewise; they both used splints of pasteboard which, previously wet in water or vinegar and thus softened, adapted itself well to the shape of the limb, and when hardened bound it so much the more firmly. Only for suppurating fractures, Aitken preferred splints of tin or iron plate to those of pasteboard. The latter were then forgotten for a long time until they were again introduced, principally by Merchie in Belgium (1850). The tin and metal splints, which Richter also preferred, Löffler of St. Petersburg thought not pliable enough to give the necessary curvature and he therefore used small strips of cane or whalebone, which, sewed into linen, fitted closely. A molded hollow splint for the lower extremities was known as the so-called Petit boot. Among the various splints (of metal, pasteboard and wood) those of Petit, which he has described and illustrated in his book on bone diseases, were considered the best (Bass). Heister also considered them very useful in complex fractures of the lower thigh, and only in the war would have straw splints used instead of them, because the field surgeons could not carry with them a sufficient number of Petit's box splints for the number of these fractures. It is entirely unjust for German surgeons, even to the present day, to always speak of the Heister splint; Heister has only the merit of having recommended in Germany the Frenchman's splint. However, splints descend from the oldest time (Galen's Glossocom), and were used by Guy de Chauliac, Paré and Duverney. Petit only improved them in that; among other things, he supplied the splint with a firm base by means of an extension appliance. In a later time Baudens was absurd enough to claim these old inventions for himself (1855). White especially recommended the *double bowed flat*, and later Earle and Bell did likewise. *Gypsum* was used by the ancients in the Orient for bandaging fractures. Knowledge of the so-called gypsum cast came to Europe in 1794, through the English consul in Bassaro, Eaton, who had learned it from an Arabian physician and informed Dr. Guthrie of it. The native Arabians on the Persian Gulf treated a soldier who had been given up by a European surgeon; they adjusted around the broken lower thigh and foot, where the ends of the bones protruded, a gypsum capsule cleft lengthwise, and cut

an opening over the fragments; the patient was cured and could walk about after four months. Gypsum has been used in Europe for fractures only since the year 1814.

(To be continued.)

SOCIETY PROCEEDINGS.

National Confederation of State Medical Examining and Licensing Boards.

Abstract of the Proceedings of the seventh annual meeting, held at Hotel Walton, Philadelphia, May 31, 1897.

MORNING SESSION.

The Confederation met at 10 A.M. and was called to order by the President, Dr. WILLIAM WARREN POTTER of Buffalo, N. Y.

An address of welcome was delivered by Dr. A. H. Hulshizer of the Pennsylvania State Board of Examiners, which was responded to for the Confederation by Dr. Charles A. L. Reed of Cincinnati, Ohio.

At the conclusion of Dr. Reed's remarks, the President introduced Regent T. GUILFORD SMITH, representing the University of New York, who said, among other things, that he had been sent to attend the meeting of the Confederation with with a view to impressing the importance of preliminary education before entrance into a medical college. It was very essential to know first that the applicant is a man of good character, of good standing in the community where he lives, and furthermore, that he has a good plain English education as a minimum standard, and this in New York State was the high-school standard.

Dr. A. WALTER SUITER of Herkimer, N. Y., read his report as Secretary and Treasurer, in which he made a few references to such matters as concerned the organization as such, in the hope that the potency of its influence might thereby be increased toward the final accomplishment of the great mission which gave to it a corporate existence, namely, unification upon the broad lines of the highest standard of educational excellence of the medical profession of the country in which we live. The Confederation was now regarded by the medical public as the central head and exponent of the examining and licensing system now adopted by a large majority of the States. The report bristled with many excellent suggestions and, on motion was adopted.

The First Vice-President, Dr. CHARLES A. L. REED, then took the Chair and President POTTER delivered the annual address, selecting for his subject,

RECIPROCITY IN MEDICAL LICENSURE.

He first paid tribute to the memory of Dr. Perry H. Millard of St. Paul, then in an introduction reviewed some of the essential points of progress that have been made in State control of medical practice, and finally considered his subject.

The problem.—The most important question now to be discussed pertains to the interstate exchange of licenses and every friend of State control is interested in establishing this principle. It is one of the objects this Confederation is laboring to accomplish, but a most difficult problem for solution. A national registration bureau is desirable where legally qualified and reputable physicians may be recorded, physicians whose names appear on the register to be allowed to pass from State to State in the enjoyment of all privileges pertaining to the practice of medicine. Those chiefly agitating the question of reciprocity, however, are specialists who desire to spend profitable vacations at summer resorts and do not relish the idea of taking State examinations in the localities chosen for their holiday practice. Another class of men compelled by circumstances to change residence, is more deserving of sympathy; they take the examination uncomplainingly. Shall a State require of its own citizens a compliance with its practice laws while granting to thrifty summer specialists exemption from their operation? As the State laws forbid discrimination against the inhabitants of each there is both a legal and a moral bar to such exemptions.

Obstacles to reciprocity.—Equality of standards for admission to the study and practice of medicine is the only enduring basis on which reciprocity can be established. When the several States adopt a uniform level of preliminaries, a uniform period of collegiate training, including uniformity of methods of teaching, and finally, an absolute similarity in the methods of conducting State examinations and granting licenses, then reciprocity will be equitably and permanently established. It is important for the State medical examiners to come to an agreement on these several points that they may act with intelligence on a common platform. The State imposes a post-graduate examination, and none should be admitted to it who are not holders of diplomas legally obtained from registered and recognized colleges. It is understood that there must be established a uniform system of recognizing and registering medical schools in the several States.

The solution—Legislative enactments.—The remedies lie in legislative enactments. Those who most loudly and persistently demand interstate indorsement aim their criticisms at examining boards, whereas these have nothing to do with the question. The statutes in States that have established licensure prohibit interstate exchange except between such as have equality of standards. The demands of the restless and migratory doctors must be taken to the legislative halls. Meanwhile, the members of this Confederation may assist in bringing the matter to a more speedy conclusion by acquainting their legislatures with the difficulties to be overcome and by urgently recommending the adoption of such amendments to existing laws as will meet and remove the present defects. Great care must be exercised, however, in the preparation of amendments; the State laws are for the public weal, while reciprocity is only for the few. Amendments to the existing statutes should be proposed only through State medical examining boards or State medical societies; they are familiar with defects and best know the remedies needed. When legislatures can be persuaded to turn a deaf ear to all amendments that are proposed outside of official sources, it will be a happy day for the friends of State license. The object of this discussion is to divert further criticism of the delay of reciprocity into the proper channel. If legislators could be made to appreciate the fact that public health interests are involved in the question of State license, that every attempt to weaken the principle is a blow at public sanitation, and that higher standards of medical education mean better health to the people, then perhaps it would be easier to obtain and maintain the necessary laws to protect the commonwealths against that kind of ignorance, superstition or superrefinement that always lurks in the environment of quackery.

AFTERNOON SESSION.

The Confederation reassembled at 2:30 P.M. with President Potter in the chair.

Dr. EUGENE BEACH of New York, offered the following resolution, which was unanimously adopted.

Resolved, That when for any reason a license to practice medicine in any State has been revoked or suspended, the proper officer of Boards of Examiners in other States should be notified of the facts.

Prof. J. W. HOLLAND of Philadelphia, delivered an address in which, speaking as a teacher enthusiastic for higher medical education, he expressed the friendly intent of college men in the growth of the work of the medical examiners. He said: Conscientious teachers, who first looked askance, were now frankly recognizing that the State examinations had proved a stimulus to students and teachers. In fifteen States the regulations required that the medical degree should first be conferred by the college before the State Boards would consider the application for license. The examining professors must continue to meet this requirement, even while they recognize the fact that the teacher's bias in favor of his pupil tends to make a lenient examiner. The mere existence of the Confederation was significant of the unity of the medical profession and the desire for co-operation in their functions. To secure uniformity among the States the prime requisite was to recognize the difference of ideals of education, not in medical qualifications so much as the preliminary branches of study. For any single licensing board to set up, as a standard preliminary to medical study, a graded curriculum requiring six or eight years and ending in a high school diploma, was to cut itself off from the satisfaction and rewards behind to attain reciprocity among the licensing boards. Was not such a standard too far in advance of the opinion of the people and the legislatures? Would not more important features of the work be imperiled by too great exaction in this particular? The task of educating each new legislature to appreciation of the needs of medical education was proving a difficult one in Michigan, Illinois and other States. Let us among ourselves prove that certain preliminary studies are *essential* to doctors everywhere and then be sure we hold fast that which is good.

Dr. WM. S. ELY of Rochester, said it was difficult for State Examining Boards to frame rules without doing injustice at some time or other to men who lacked the advantages of early education; and yet some of these men, by the possession of wonderful skill which amounts to genius, were able to make up for all the Latin and Greek and all the culture they may represent in the practical outcome of their work.

Dr. WILLIAM BAILEY of Louisville, in speaking of minimum requirements, said it was difficult to apply the principles that might be applicable to some districts, to Kentucky. He would like to see a graduate of Princeton or of Yale, after going through with his collegiate course, graduating with honor, spending four years in Jefferson Medical College, then going into one of the back counties of Kentucky, undertake to make a living. The people would not understand him. He was in sympathy with the most perfect advances that could be made in medical education, and he heartily approved of examining boards investigating medical colleges.

Dr. N. R. COLEMAN of Columbus, Ohio, read the preliminary

REPORT OF COMMITEEE ON MINIMUM STANDARD OF REQUIREMENTS FOR ADMISSION TO MEDICAL COLLEGES.

The object of this report was to prescribe such a standard as may serve as a common ground upon which all of the examining and licensing boards of the United States may unite, both with credit and protection to society. The question of practicability must take cognizance of the existing status not only of medical education, but of preliminary education in each of the several States of the Union. The present report was submitted only as one of progress, with the suggestion that the Committee on Minimum Requirements be continued for the ensuing year. It was important for the Confederation to consider the requirements already enjoined by the colleges themselves. These are as follows:

SECTION 1. Colleges, members of this Association, shall require of all matriculates an examination as follows: 1. An English composition in the handwriting of the applicant of not less than 200 words, said composition to include construction, punctuation and spelling. 2. Arithmetic, fundamental rules, common and decimal fractions, and ratio and proportion. 3. Algebra, through quadratics. 4. Physics, elementary (Gage). 5. Latin, an amount equal to one year's study as indicated in Harkness' Latin Reader.

SEC. 2. Graduates or matriculates of reputable colleges or high schools of the first grade, or normal schools established by State authority, or those who may have successfully passed the entrance examination provided by the statutes of the State of New York, may be exempted from the requirements enumerated in Section 1.

SEC. 3. Students conditioned in one or more of the branches enumerated as requirements for matriculation, shall have time until the beginning of the second year to make up such deficiencies; provided, however, that students who fail in any of the required branches in this second examination shall not be admitted to second course.

The foregoing extract, being Article III of the Constitution of the Association of American Medical Colleges, is to be accepted not only as the official declaration of the schools, but as the definition of the existing practice among them. It is the belief of the Committee that the colleges as a rule, particularly those of a higher class, are enforcing those regulations with a commendable degree of uniformity. Other schools are known to be lax in this particular. The supplementary evidence required by many of the licensing boards brings to the surface many examples of gross illiteracy which could not exist if the rules adopted by the College Association, as set forth above, were rigorously enforced. In the opinion of the Committee, no profession can maintain its pretension to be a learned profession, the preliminary educational requirements of which are placed upon the low plane indicated in the Constitution of the American College Association. The view is generally entertained, and the Committee is impressed that its position is a tenable one, that admission to a medical college ought to be based upon at least as high requirements as those for admission to an academic course in our universities. This view has been emphasized in the State of New York, in which, under the administration of the Regents of the University, the high school curriculum leads to the door of the academic facilities. This state of affairs, however, does not exist with any degree of uniformity in other parts of the United States. In certain of the States, education beyond the common school grade is by no means definitely organized. In others the standards are determined by municipal rather than State regulation. It is, therefore, important in designating a high school course, that the curriculum itself be specified; the general term is without specific significance. What is needed in the various States is a central body or authority which shall define and preside over the general educational interests of the State. In this way alone can the question of uniformity in educational requirements, as implied in a high school course, be determined. The Committee is of the opinion that it would not be well for the Confederation to employ the term "high school course" as definitive of the minimum requirements for admission to medical colleges without going a step further and defining just what is implied by the term "high school course."

The question of the conduct of examinations for admission, by independent examining boards, is a proposition which ought to be warmly supported by every right-thinking, honest-working medical faculty. The schools that come within the purview of such a law are relieved of all suspicions and imputations of commercialism. When such a proposition is advanced, the practical difficulty encountered in many of the States is the absence of the central authority vested with the power to conduct such examinations.

The Committee is deeply sensible of the fact that the matter of minimum requirements is one that should take precedence over all others in the general question of medical education. It is not, however, unmindful that much criticism that is effective with a legislative body, lies in the fact that a very long period of time is embraced in the academic and professional courses. The Committee commended the position taken by the Ohio State University in furnishing a course leading to the baccalaureate degree, especially adapted to the needs of medical students, and which course is covered in the period of three years. The practical character of this course can only be indicated by a specific enumeration of its studies, which we give below:

OHIO STATE UNIVERSITY. COURSE PREPARATORY TO THE STUDY OF MEDICINE.

Applicants must be at least seventeen years old, and must pass in grammar, geography, arithmetic, algebra (through quadratics), plane and solid geometry, physics, rhetoric, United States history and botany, and either astronomy, civil government or general history.

FIRST YEAR.

First Semester.	Credit hours.	*Second Semester.*	Credit hours.
Botany: Systematic and physiologic	4	Botany (½ semester): Medical	1
Latin: Pharmaceutic	5	Latin: Pharmaceutic	5
Physics: Mechanics, heat, etc	3	Physics: Electricity, magnetism, etc	3
		Physics: Laboratory	2
		Physiology (½ semester): Microscopy	1
Rhetoric: Paragraph writing	2	Rhetoric: Analysis of prose	2
Zoology: Comparative	3	Zoology: Comparative	3
Cadet service (men)		Cadet service (men)	
Hygiene and phys. train. (women)		Hygiene and phys. train. (women)	

SECOND YEAR.

First Semester.	Credit hours.	*Second Semester.*	Credit hours.
French: Elementary / German: Elementary	4	French: Prose and plays / German: Elementary	4
General chemistry: Inorganic	3	General chemistry: Inorganic	3
Physiology: Human anatomy	5	Rhetoric: Prose analysis	4
Zoology: Comparative anatomy	5	Zoology: Comparative anatomy	5
Cadet service (men)		Cadet service (men)	
Hygiene and phys. train. (women)		Hygiene and phys. train. (women)	

THIRD YEAR.

First Semester.	Credit hours.	*Second Semester.*	Credit hours.
French: Science reading, or / German: Science reading	2	French: Science reading, or / German: Science reading	2
Economics: Political economy	4	Economics: Political economy	4
Philosophy: Psychology	4	Philosophy: Logic and ethics	4
Pharmacy: General	8	Pharmacy: General laboratory	5
Physiology: Laboratory	5	Physiology: Laboratory	5

The Committee is of the opinion that a general adoption of the example set by the Ohio State University will presently bring us to contemplate the pleasant spectacle of the general adoption of an academic rather than a high school qualification for admission to medical colleges.

The report concluded with the recommendation that, as far as it be vested in the discretion of existing examining and licensing boards, the rule be enforced that any colleges to be considered in good standing must enforce an entrance requirement embracing the studies of English grammar, English composition, rhetoric, Latin (two years), arithmetic, algebra (through quadratics), plane and solid geometry, physics (especially in heat, light, sound and electricity), botany, zoology, United States history, civil government, one modern language other than English (two years); or a high school diploma issued after four years' attendance and based upon examinations in the foregoing subjects. These subjects are embraced in the courses of a large majority of high schools which require four years of study.

DISCUSSION.

Dr. JOHN A. LARRABEE of Louisville, said if the standard proposed and the conclusions reached be carried out, he feared the Confederation would be deprived of many of its valuable members, and that the Association of American Medical Colleges would be depleted to a considerable extent. In regard to the qualifications being equal to degrees in colleges at their

close to the baccalaureate or A.M. degree, that would leave out all but two or three of the Faculty of the University of Pennsylvania. He cited this to show that there was danger in making progress too rapidly. If we have the minimum requirements of the College Association, we had a good academic education, and what more could be desired for commencing a four years' course of study?

Dr. T. J. HAPPEL of Trenton, Tenn., said the idea of requiring the study of astronomy was something he did not understand. He failed to see what object it could serve, unless to tell us when we might do an operation in accordance with the signs of the almanac. With reference to a high school diploma or a certificate of graduation from a high school being accepted in lieu of an examination for entrance to a medical college, his experience for the last seven years as Secretary of the State Board of Tennessee, was that a certificate from the average high school was not worth much more than a diploma of the average medical school ten years ago. Let the medical colleges examine every young man regardless of what he brings with him in the way of a diploma or certificate.

Dr. L. B. GODFREY of Camden, N. J., referred to the interchange of certificates. New Jersey had been unable to effect an interchange of certificates with New York up to this time; yet he was prepared to say, that the New Jersey standard was higher than that of New York; that the former required a more thorough medical education.

Dr. J. P. CREVELING of Auburn, N. Y., endorsed the report of the Committee. The State of New York rejects from 30 to 33 per cent. of applicants, while in the examinations in New Jersey they reject from 10 to 12 per cent. He could hardly believe that New Jersey was so rigid in its examinations.

Dr. HUGH M. TAYLOR of Richmond, Va., believes very little good can be accomplished by enacting laws to govern medical colleges, as they could not be controlled in that way.

Dr. AUGUSTUS KORNDOERFER of Philadelphia, said the great difficulty which he had observed in all discussions upon the subject of preliminary examination was that the whole idea seems to be to expect from the candidate a general literary education rather than a preliminary preparation. The whole thought of the Committee should be centered in one line, namely, how to develop a course of preliminary study to fit a medical student for the reception of the lectures he hears in a medical college, etc. If proper preliminary qualifications were required of applicants seeking admission to our medical colleges, it would better fit them for the study of medicine.

Dr. WILLIS F. WESTMORELAND of Atlanta, Ga., said if history, geography, higher mathematics, modern languages, etc., were to be incorporated in the prelimary requirements, very few men in the Confederation would be competent to conduct the examination. If a physician went before the Georgia legislature and exacted of all applicants such qualifications before entering upon the study of medicine, it would mean the wiping out of existence everything that has been accomplished in the past few years.

Dr. S. R. DUNN of Mississippi, said that while he agreed with the proposed advancement, the work should be undertaken with great care. Medical colleges could make what rules they saw fit for the admission of applicants to their schools, and the legislatures of the various States could not abolish them, and were an attempt made by State examining boards to prevent graduates or non-graduates from coming forward to be examined under stringent rules, he fears it would result in the abolishment of State examining boards.

Dr. A. K. P. MERSERVE of Portland, Me., said State examining boards were appointed not to attend to medical education, but to see by thorough examination and to judge of the character of the men presented whether their education has been satisfactory. These boards had the power to reject men who could not spell such words as radius and ulna, and he thinks the colleges would learn a good deal by the rejection of such men.

Dr. WM. S. FOSTER of Pittsburg read a paper on

SOME PRACTICAL EXPERIENCE WITH AND THE RESULTS OF THE MEDICAL LAW OF PENNSYLVANIA.

Reference was made to the present medical law of Pennsylvania, which went into effect March 1, 1894. The act provides for three boards of seven members each, representing the State Medical Society of Pennsylvania, the homeopathic and eclectic associations. The "regular" board, representing close to six sevenths of the physicians of the State, was accorded the privilege and responsibility of taking the lead in formulating suggestions and rules for the government of the respective boards, as well as details pertaining to the examinations. The entire field of medicine is divided, for examination, into seven departments or subjects. These departments and the subjects allotted to each were then taken up *seriatim*. The essayist closed by saying that the most serious deficiency in medical graduates today was the want of sufficient preliminary education.

Dr. W. H. SANDERS of Montgomery, Ala., followed with a paper entitled

THE ALABAMA SYSTEM.

The author prefaced his remarks by giving a brief explanation of the fundamental principles underlying the organization of the medical profession of the State.

The Board of Censors of the State Medical Association acts as a committee of public health for the State, and in the intervals of the sessions of the State Association exercises all of the functions conferred upon that body. This same Board also acts as a State board of medical examiners. The authorized boards of medical examiners are: 1, the Board of Censors of the State Medical Association acting as a board of examiners, and known as the State Board; 2, the boards of censors, also acting as boards of examiners, of the several counties of the State, of which there are sixty-six, known as the County Boards.

In order to practice medicine in Alabama a successful examination must be passed before some one of these authorized boards. The standard of qualifications, the subjects and methods of examination and the rules for the government of the examining boards are such as may be from time to time prescribed by the State Medical Association.

The rules at present in force may be briefly stated as follows:

1. All examinations must be in writing, and must comprise ten branches, viz., chemistry, anatomy, physiology, natural history and diagnosis of diseases, physical diagnosis, surgery, mechanism of labor, obstetric operations, hygiene and medical jurisprudence. Materia medica and the practice of medicine are intentionally omitted from this schedule in order to avoid ground upon which different sects or schools of medicine disagree.

2. The examinations are conducted by a paid supervisor, and are intended to be so conducted as to render it impossible to obtain aid. The answers to the questions are separately valued, one hundred being the maximum. For an examination to be successful, the final average must not fall below seventy-five. The time consumed in an examination is usually from six to ten days.

3. Every written examination made by a county board must be reviewed and reported upon by the State Board.

4. The county boards are not allowed to examine any applicants for license unless they hold diplomas from reputable medical colleges, the State Medical Association determining the question of reputability. Non-graduates can be examined, but they must apply to the State Board.

5. If any applicant is rejected by a county board he can not obtain a second examination by any county board until after the lapse of twelve months, but he may forthwith appeal to the State Board, which will not review the previous examination, but proceed to give an entirely new one.

6. Eclectics and homeopaths must be subjected to the same examination as "regulars." The law does not recognize sectarian differences among doctors, but erects the same standard of qualifications for all.

7. Anyone proposing to locate in a given county of the State must apply for a license either to the Board of that county, or, if he prefers, he can apply directly to the State Board. From whichever source a certificate of qualification is obtained it must be recorded in the probate office. A certificate may be transferred from one county to another.

8. All examination papers are bound and so filed as to be of easy reference.

9. Fees: To the supervisor, ten dollars; for registering in probate office, one dollar.

A very natural criticism of the Alabama law would be that it creates a multiplicity of Boards, but viewed from another standpoint this is an element of strength rather than of weakness. The great aim is the organization and discipline of the medical profession throughout the State; and the most potent of all the factors is that the County Medical Societies, through their Boards of Censors, have been made the agents of the State for the administration of the law to regulate the practice of medicine.

The following preamble and resolution was introduced and adopted:

WHEREAS, There exists in this country, under full authority of law, every grade of medical school, from those which equal the best in the world, to those which have not even a pretense of teaching force or equipment. And,

WHEREAS, Little official or authentic information exists or is available relating to the methods or standing of the low grade

and fraudulent schools in such form that it can be relied upon and used by licensing bodies and courts.

Now, Therefore, be it

Resolved, That a Committee of twelve be appointed by the Chair, so distributed geographically that convenient sub-committees of three may be formed, whose duty it shall be during terms to visit, inspect and report on the equipment, teaching methods and requirements of every medical college in the United States, said report to be made to this body at its next annual meeting.

The election of officers resulted as follows: President, Dr. Wm. Warren Potter, Buffalo, N. Y.; vice presidents, Dr. E. L. B. Godfrey, Camden, N. J., and Dr. William Bailey, Louisville, Ky.; secretary and treasurer, Dr. A. Walter Suiter, Herkimer, N. Y.

The Confederation expressed its regret, in the form of a resolution, at the early death of one of its most active, companionable and accomplished members—Dr. James Mackintosh Hays, of Greenboro, N. C.

Adjourned.

SELECTION.

Suture of Arterial Wounds.—Djemil Pasha of Constantinople, reported at the Moscow Congress two cases, one in 1894 and the other in 1896, in which he had sutured the axillary artery in the course of an operation to extirpate a recurrent cancer of the mamma. He continued: It frequently happens that surgeons are compelled to ligate a large artery, either because it has been accidentally injured in the course of an operation, or on account of some small aneurysm or an arteriovenous aneurysm, when a few stitches would have made it possible to retain the physiologic functions of the artery and save a member from occasionally inevitable gangrene. For a certain number of years, thanks to the efforts of German surgeons, suturing wounds in the veins has become almost a classic procedure, and several communications on the subject have been published. On the other hand, very few observations of sutured arterial wounds have been reported, and almost all the classic works are dumb on this very important subject.

Glück was the first to call attention to the suture of arterial wounds, when he reported to the Berlin Medical Association a case of arteriovenous aneurysm in Scarpa's triangle, in which Jage-Charteuffel had successfully sutured the femoral artery. Israel reported a second case, in which the external iliac artery had been sutured in the course of a difficult operation for perityphlitic suppuration. Heidenhain also has reported the suture of the axillary artery for carcinoma of the right mamma.

Quite recently J. B. Murphy, in an important article in the *New York Medical Record*, of January, 1897, has demonstrated that it is not only possible to suture arterial wounds, but also to resect a considerable portion of the artery. After performing the operation thirty-four times on dogs and calves, he applied it to man with complete success. He proves that simple suture is impracticable, if more than half of the circumference of the artery is torn. In such a case he advocates resection of the injured portion, followed by suture of the ends of the artery after invagination. He reports the case of a young man of 29 who had been shot in Scarpa's triangle. The hole in the artery was three-eighths of an inch in length. He resected one-half inch and sutured the central to the peripheral end with invagination.

Before having any knowledge of the observations and labors of Heidenhain, Israel and Glück, we performed the operation of suturing a lacerated artery with perfect success, more than two years ago. The first observation was the case of a woman 49 years old, Mrs. Kristik, who had recurrence of a carcinoma of the left mamma extirpated six months before. The recurring tumor was firmly attached to the vasculo-nervous bundle in the axilla, the left superior member edematous, with violent pains in the axilla and member. A second operation was decided on and performed Feb. 5, 1895. As the tumor encircled almost the entire vasculo-nervous bundle, we were obliged to proceed to an actual anatomic dissection, during which the axillary artery was injured and the hemorrhage arrested by compression with the finger. I prepared a strong silk thread to ligate the artery, but recalling an unfortunate case of gangrene of the superior member consecutive to ligature of the axillary artery for a laceration that occurred during curettement of the axilla, I abandoned the idea of ligating and determined to suture the injured part of the artery, as had been done for venous lesions. The wound, 15 mm. long, was parallel to the longitudinal axis of the artery. After having wound the blades of a couple of pairs of long, flexible curved forceps with sterilized gauze, I applied them to the artery, one above and one below. The hemostasis was complete. With a very fine curved Reverdin needle, I took five stitches, with extremely fine silk thread, close to the edge of the tear, and two more stitches in the sheath of the artery. Immediately afterward the forceps were removed and the circulation proceeded quite regularly. A few minutes' compression was sufficient to arrest the slight oozing of blood through the stitch holes. The artery pulsated strongly; the lumen was not contracted and the sutures held perfectly. The skin was sutured, leaving a small strip of sterilized gauze over the suture, to produce a slight compression, and also to enable the artery to be seized in case of ulterior hemorrhage. The patient passed a good night.

The next day the dressings were renewed and the gauze removed. The superior member was not edematous. We removed the sutures in the skin February 13, and the wound healed by first intention. The patient left the hospital the fifteenth day after the operation, completely cured. The pulsations of the axillary and even of the radial artery could be distinctly felt, but not quite so forcibly as on the other side. It is now two years and a half since the operation. I saw the woman again recently, and examination showed that the axillary artery pulsated its entire length, without trace of traumatic aneurysm.

The second observation was a recurrence of a malignant tumor of the right mamma, which had been extirpated with the whole of the pectoralis major and the corresponding axilla curetted. The patient was a woman of 48 years. The second operation occurred Aug. 15, 1896. As all the vasculo-nervous bundle was firmly adherent to the tumor, I was obliged to resect a large piece of the axillary vein and the two branches of the median nerve. In the process the artery was torn. I succeeded in arresting the hemorrhage, as above described, and discovered a lesion a centimeter in length, which I closed with four stitches, using a Reverdin needle and fine silk, as before. I could not suture the sheath in this case, as that had been destroyed in extirpating the tumor. The forceps were removed at once and as the circulation was restored the artery beat its entire length, the lumen no smaller than before. The integument was sutured with silkworm gut, and a strip of sterilized gauze left near the suture. For more than a month the superior member remained edematous and the large wound which extended to the sternum cicatrized with suppuration, but the wound in the axilla healed by first intention. Two months later I examined the patient, finding that the axillary and radial artery pulsated perfectly, but not so forcibly as on the other side. There was no traumatic aneurysm. The patient died later from generalization into both lungs; a necropsy was impossible.

The observations published by Glück, Israel and Heidenhain and Murphy's experience, demonstrate very clearly that we can not only suture a wound in an artery as we would in a vein, but also resect and suture the stumps of an artery with perfect success and without inconveniences. The technique is extremely simple, the chief point being to secure absolute hem-

ostasis in order to determine the extent of the wound and to take the stitches properly. This can be accomplished in two ways; by applying as I did long, flexible forceps wound with sterilized gauze or rubber; one 2 cm. above and the other the same distance below the wound; or as Schede recommends for suturing a vein by applying three or four pairs of Téan's forceps close together the entire length of the wound, removing one at a time as the stitches are taken. It seems to me that the hemostasis is more complete and certain, which is an indispensable factor in the suture of arterial wounds, if the forceps are applied above and below the wound with care not to compress the coats too tight.

After having cleared the field of blood and clots the suture is made with a very delicate, slightly curved Reverdin needle, and a strong, very fine silk thread. Four stitches are sufficient for a tear 1 cm. long. If the sheath has not been destroyed it is better to suture that also with two or three stitches to insure against secondary hemorrhage. It also provides a protecting rampart in case of eventual suppuration. If there is slight oozing after the suture, compression with a gauze tampon will check it. As soon as certainty in regard to the re-establishment of the circulation is attained, every precaution must be taken to insure cicatrization by first intention. A small strip of gauze must be left at the point of the suture. It acts as a tampon on the wound and also enables the artery to be seized in case of ulterior hemorrhage, but it should be removed in twenty-four hours after the operation to allow the wound to heal by first intention.

Conclusion.—When the tear in the large arteries: carotid, subclavicular, axillary, external iliac, femoral, etc., does not extend more than 2 cm. in length or more than three eighths of the circumference, the artery must be sutured instead of ligated, as ligatures entail distressing results in the majority of cases. In longitudinal tears more than 2 cm. in length, or in tears involving more than half of the circumference, resection and suture of the stumps by invagination according to Murphy's method should be attempted before resorting to the ligature. There need be no apprehension of a traumatic aneuryism, nor of an endarthritis with thrombosis after suture of an arterial wound.

Dr. J. B. Murphy of Chicago, also demonstrated before the Congress his method of suturing blood vessels after injuries and reported five operations in which he had sutured large vessels. He rejects the principle of provisional ligatures or compression as liable to injure the intima, and secures hemostasis by placing a strong silk thread around the vessel, with which it is held tight against the finger. In all longitudinal injuries, and when continuity is retained for half of the circumference, suture of the vessel should be attempted. In other cases it should be resected for a centimeter and reunited by invagination.

Nitze of Berlin exhibited a small apparatus which he has invented for the purpose of vascular sutures. It consists of a small ivory support on which the ends of the vessel are fitted, bringing the intima into contact. A circular ligature is then applied which holds after the support is removed; tested on animals.

PRACTICAL NOTES.

Parasite of Malarial Fevers at Sierra Leone.—At a meeting of the Royal Medical and Chirurgical Society, Surgeon-Captain C. W. Duggan read a paper on the "Parasite of the Malarial Fevers at Sierra Leone." He described the symptoms of the severe malarial fevers which prevail at Sierra Leone, and gave the results of his observations on the parasite of malaria which is associated with these fevers, from which both Europeans and natives suffer. During two years' residence there he examined blood from the finger in nearly 400 cases and made special duty of fifty cases. Eleven of these cases were given in some detail. His description of the symptoms which usher in and last during the attack did not differ materially from that given by previous observers. In all the cases he found parasites in the blood from the finger. The form in which they were seen was as a very minute ring-shaped body, which in a later stage slightly enlarged, and contained a few very minute grains of pigment. A more advanced stage than this was not observed in the freshly drawn peripheral blood, with one or two exceptions. In blood taken from the surface of the brain in a fatal case he found sporulating forms. The parasite is very small, and even in the sporulating stage only takes up about a third of the red corpuscle. He counted five spores in one parasite. In the majority of cases, after some days' fever, the crescent forms of the parasite were observed, and he described various stages in its development. In one case only did he observe appearances in the parasite which could be interpreted as being possibly due to spore formation. In all the cases observed by him the tertian parasite was observed once only. This occurred in a man who had suffered from malarial fever two years previously in the West Indies. The quartan parasite was never observed. All the appearances observed were analogous to similar appearances described by Marchiafava as being found in the summer-autum fevers of Rome, and, morphologically, Surgeon-Captain Duggan was not able to detect any difference between Marchiafava's parasite and that of Sierra Leone. The crescent body in shape and size resembled that described by Laveran and the Italian authors. In dried and stained preparations of the small parasite in the finger-blood, a deeply stained nucleolar body could sometimes be observed at one point in the periphery; at other times in the center of the parasite surrounded by an unstained zone, whilst the periphery stained; sometimes two such nucleolar bodies could be observed. In the stained preparations the very fine pigment was observed on the periphery of the parasite. Dr. Thin remarked on the importance of a microscopic examination, and mentioned a case in which there was no fever, but in which by careful searching Surgeon-Captain Duggan established the diagnosis by demonstrating the malarial parasite. The fevers on the west coast of Africa were extremely fatal as compared with those in the south of Europe, and this appeared to be due to a plurality of parasites. As illustrating the danger to Europeans he mentioned an instance in which four out of five artisans died from fever almost immediately after arrival in the country. One of them was attacked on the second day, showing an unusually short period of incubation. Death occurred on the fourth day. The regular administration of quinin had a most remarkable protective effect. Dr. Mansen drew attention to the previous work of Plehn in the Cameroons, which pointed in the same direction. Microscopic examination was of the utmost importance for purposes of diagnosis, as many of the cases now known to be instances of severe malaria would formerly have been returned as cases of sunstroke. He regarded the practice in the army, of discharging men from the hospital after three days treatment, as quite inadequate, as observations showed that the parasite recurred in the blood at the end of the week. Patients should be retained in the hospital for two or three weeks, until the parasite had entirely disappeared from the blood, and if the presence of the parasites was persistent the patient should be deported from the country. He was surprised that reference was only made to the crescentic forms, as the flagellated forms could easily be produced by placing the cover glass with the film of blood in a damp cell made with a piece of wet blotting-paper. With reference to transmission of the parasite by means of mosquitoes, he pointed out that the transference was not direct, as the mosquito did not suck blood more than once. He believed that this insect was the host in which the parasite developed, and he had specimens demonstrating the presence of the flagellated form of the parasite in its stomach.

Successful Operation for Rupture of the Liver.—Moore (*Lancet*, Sept. 18 1897, p. 722) reports the case of a boy 11 years old who was kicked in the lower part of the right side of the chest by a horse. He became completely collapsed and complained of great pain in the side, and a diagnosis of rupture of the liver was made. In the course of four or five hours the abdomen had become distended, the distension continuing for about five days, without the addition of other symptoms. The bowels acted after enemata. In a short while vomiting set in and was thought to be due to pressure on the duodenum or pyloric end of the stomach. The vomited matter was fluid and of a greenish color, with specks of blood in it. The bowels were now constipated, despite the administration of enemata and purgatives. The patient suffered from pains at times which appeared to occur in paroxysms. The child was pale and thin and lay on his back with his knees drawn up. The temperature was normal and the pulse accelerated, of small volume and easily compressible. There was no abdominal distension, but there was some fulness in the hepatic region and the area of liver dulness was increased. On percussion there was marked tenderness over the liver. Hot fomentations were applied over the upper part of the abdomen and for some days the boy then presented no symptoms of importance. The bowels acted and the temperature was normal. Shortly, however, the respiration became much quickened, and on examination it was found that there was a large rounded swelling below the ribs and just to the right of the mid-line. The liver dulness became gradually increased and there was dulness over the right side of the chest almost up to the clavicle. The abdomen was somewhat distended and tympanitic. These conditions grew slightly more marked, while the area of the liver dulness became a little increased downward in the mid-axillary line. The temperature was slightly elevated. On aspiration of the chest in the sixth right interspace, twenty-four ounces of yellowish-green (bile-stained) fluid were withdrawn. The fluid was subsequently found to contain bile. The chest at once became resonant in front and in the axilla. The prominence in the epigastrium became slightly less. For the next two days there was no improvement in the patient's condition. His pulse was quick, feeble and irregular and he was very pale. In the epigastrium, a little to the right of the mid-line, the rounded swelling had become very prominent and distinct. The margin of the liver could be felt about two inches above the umbilicus. The abdomen became gradually distended all over and tympanitic except in the epigastric and right hypochondriac regions. At this time he lay generally with his knees drawn up. Under chloroform, a three-inch vertical incision was now made through the rectus muscle a little to the right of the mid-line, commencing just below the ribs. The parietal peritoneum appeared to be much thickened, and on opening it a cavity containing a large quantity of dark fluid, in which clotted blood and bile could be easily distinguished, was entered. This cavity was very large, at least six inches deep, and it extended upward toward the diaphragm. The upper convex surface of the liver could be felt forming its lower boundary, and it was shut off from the general peritoneum by adhesion of the liver to the anterior abdominal wall. The cavity was washed out with warm boracic lotion and drained with strips of iodoform gauze. Four horsehair sutures were used to close the ends of the incision. The wound was covered with dry antiseptic dressings. Even after this the boy's condition was not satisfactory. The discharge from the wound quickly diminished and in a few days almost ceased. The temperature was slightly raised. There was no increase of dulness in the front of the chest or in the axillary region, but the epigastric fulness was well marked and now it appeared to fluctuate distinctly. On introducing a hypodermic needle through the wound a little dark, bile-like fluid was withdrawn. As the patient was about to be taken to the operating room he was seized with vomiting and his temperature rose to 103.6 degrees. He was anesthetized and a trocar and canula were introduced through the wound into the fluctuating swelling in the epigastrium and dark fluid bile flowed through the canula. The latter was removed and forceps introduced, opened and withdrawn in order to enlarge the opening. In this way a very large quantity, probably several pints, of fluid was evacuated. A large rubber drainage tube was introduced and left in place. From this time the patient rapidly improved. He became less pale, his breathing was easier and the fulness in the epigastrium disappeared. The discharge of bile was very profuse for about a week, but subsequently the tube was removed and the discharge ceased entirely before the patient was dismissed.

Fatal Poisoning by Arsenic in the Vagina.—Haberda (*Centralbl. für Gynäkol.*) states that a maidservant from Styria, aged 25 years, was seized with vomiting and faintness on September 20, left her situation in Vienna on September 22, and was picked up prostrate a day later and sent to a hospital. She was almost pulseless and the abdomen very tender; she pretended that she was menstruating, and no pelvic examination was made, but as she stated that she was constipated, an enema was given and a stool with bloody mucus came away. There was scarcely any pulse, and she died on September 25. At the necropsy, acute fatty degeneration and hemorrhages in solid viscera were detected and phosphorous poisoning suspected, so Haberda made a closer examination of the subject on order from the magistrates. He found icterus and hemorrhages under the skin and in the muscles. The spleen was greatly enlarged and there was recent fibrinous pelvic peritonitis. Arsenic poisoning was suspected. On searching the vagina a paper bag was found containing still a quantity of white arsenic in fine crystals. Acute inflammation of the vagina with false membrane on the labia minora and incipient sloughing of the rectal mucosa over the rectovaginal septum were detected. The labia majora were very edematous. The case was probably suicidal, as the deceased had told the hospital authorities that she was menstruating so as to throw them off their guard, though the pain must have been intense and desire for relief urgent. Haberda states that in the last century a peasant murdered three of his wives by introducing arsenic into the vagina after connection. Another wife murder was effected in the same way in 1799. In 1864 a single woman, finding herself pregnant, attempted to produce abortion by this means, but killed herself thereby. In 1890 a prostitute was murdered by a man who by force introduced a quantity of arsenic into the vagina, wrapped up in a knot of horsehair.—*British Medical Journal.*

Gastro-Jejunostomy for the Relief of Gastrectasis.—In a communication presented to the Missouri State Medical Society, Cordier (*Medical Record*, Sept. 25, 1897, p. 441) offers the following conclusions: 1, Carcinoma of the pylorus, even though removed, returns quickly and always kills; 2, pylorectomy is attended with a high mortality and is not a justifiable surgical procedure in cases of advanced carcinoma of the pylorus; 3, gastrectasis due to malignant closure of the pylorus is best treated by gastro-jejunostomy; 4, the operation advised by von Hacker best meets the indications; 5, it is not necessary to twist the bowel in making an anastomosis to prevent the bile from entering the stomach; 6, the anastomotic opening in the stomach should be at the most dependent point of the dilated organ; 7, the operation is attended with a low mortality; 8, in all cases in which marked dilatation of the stomach exists and is accompanied by emaciation, pain and invalidity the operation of gastro jejunostomy should be performed; 9, the relief of pain due to the effort of the stomach to relieve itself follows this procedure at once, the patient gains rapidly in weight and if non-malignant disease be present his former good health is restored.

Treatment of Otitis in Children.—*Before suppuration:* Soothe the pain and disinfect with 10 drops of phenicated glycerin at 1 to 20, slightly warmed in a small spoon and poured into the ear, closing the orifice with a little boricated cotton. Otherwise leave the ear in repose; no injections, etc. If this is insufficient, relief from the pain can sometimes be obtained if the tympanum is not perforated, by a ten minute local bath of 10 drops of the following solution, as hot as it can be borne: 1 per cent. phenicated water 10 grams; cocain hydrochlorate 2 grams; neutral sulphate of atropin 0.05. If pain persists, cover the region with a hot compress of boricated water. If the base of the mastoid apophysis becomes painful to pressure and swollen, keep an ice-bag on it continuously, with the phenicated glycerin in the ear. Prescribe at the same time 2 to 3 grams of antipyrin a day, with 1 gram of sulphate of quinin; also a saline purgative, hot foot baths and naso-buccal antisepsis. If pain persists forty-eight hours, puncture the tympanum. *After suppuration:* Continue the local antiseptic treatment of nose and throat, with injections of tepid boiled water and douches of air by the nose with a Politzer syringe. The dressings, injections, douches, etc., repeated twice a day, with the auditory canal kept full of phenicated glycerin in the interim. Continue this treatment for two to three weeks, the average duration of acute suppurating otitis.—Lermoyez in *Jour. Méd. de Paris*, August 15.

Herpes and Tuberculosis.—Rouher has recently published some interesting details bearing upon a possible relation between zona and tuberculosis. It may appear under three different conditions: First, toward the end of severe pulmonary tubercle, and it is then of no special interest, but in other cases it is a very early symptom, and may, according to the writer, be looked upon as a premonitory sign. Thus he quotes cases of patients subject to herpes zoster but who did not complain of any pulmonary affection. On examination of the lungs however, early tuberculosis was discovered. In other cases forming the third group, the signs of pulmonary tubercle may be discovered after a short interval, there being no physical indication at the time of the eruption. Although zona seems to affect neuropathic or neuro-arthritic subjects, it results from the author's observations that in every case of this disease the patient should be kept under observation more particularly as concerns the lungs. The author points out the extreme importance and utility of this question should it be supported by more extensive observations.—*Journal de Médecine.*

The Aseptic Sponge in the Treatment of Metritis.—Lutaud rejects the use of caustics and the curette, except for voluminous proliferations. After slow dilatation with two or three laminaria tents of increasing sizes, requiring three to six days, and swabbing out the uterus with 1 to 10 iodoformed ether, he irrigates with hot 3 per cent. solution of sodium carbonate, first the uterus and then the cervix, and swabs again. Then he introduces a compressed sponge, in severe cases dipped for two minutes in salicylic acid, 1; alcohol, 10; water, 240. He disinfects his sponges by soaking them in a solution of naphthol or sublimate at 1 to 1000, until they are fully expanded, when they are compressed and cut as usual and kept in a well-corked bottle filled with iodoform. The sponge can be left in the uterus for six to eight hours; it produces no pain. As it expands it fills the uterine cavity completely, and squeezes the application into the remotest crevices. If indicated, he performs the Emmett operation.—*Journal de Méd. de Paris*, August 22.

Exophthalmic Goiter Treated by Resection of the Two Cervical Sympathetics.—Gerard-Marchant (*La Presse Médicale*) treated a patient with exophthalmic goiter by resection of the inferior portion of the right and left superior cervical ganglia with about two inches of the nerves; an improvement in the eye condition was noticeable almost immediately, and this increased until the exophthalmos was very slight indeed. The pulse decreased from 80 to 100 to a constant rate of 80. In the same number of this journal, Chauffard mentions a similar case occurring in a man. Quenu performed a bilateral operation as above described. The immediate results were scarcely noticeable. Two and one half months later an attack of tachycardia came on, and the patient was given a bottle of digitalis with instructions regarding its use. He took nearly the whole contents of the bottle and died some hours later of acute digitalism. However, he lived long enough to demonstrate the failure of the operation.—*Medical News*, September 25.

Improvement in Sounds, etc.—One of the little annoyances that bother the busy practitioner is the difficulty of screwing a metal sound into its conductor at the bedside; the screw never catches in the thread at first. Gourdet has obviated this difficulty by having his sounds, etc., made with a smooth continuation of the screw part, extending about the same distance below, the diameter just large enough to allow its being slipped into and beyond the female screw in the conductor into a corresponding hole below, bringing the two long axes of the sound and conductor into line at the first contact.—*Presse Médicale*, July 28.

Treatment of Anal Pruritus.—Make frequent lavages with chamomile water, boricated or combined with saponined coal tar; afterward apply a soothing salve of vaselin and zinc oxid, and powder profusely with the following powder: pulverized camphor, 2 grams: zinc oxid, 30 grams; bismuth subnitrate, 30 grams; talc, 40 grams, holding the powder in place with absorbent cotton. When the parts are less irritated, paint every other day with a 25 per cent. solution of nitrate of silver. A suppository of cocoa butter, cocain and belladonna can also be inserted every night.—L. Brocq, in *Jour. de Méd. de Paris*, August 8.

Flexion Cure for Sciatica.—P. Bonuzzi reports ten absolute cures in fourteen cases of obstinate sciatica, treated by his method of forced anterior flexion of the body preceded and followed by massage at intervals of one to five days. Improvement commences with five or six, and the longest time required was twenty séances. When all other means have failed he recommends this treatment, which is merely the bloodless stretching of the nerves involved in the neuralgia. He never uses chloroform, but advises it in extremely painful cases. Only one case resisted the treatment completely.—*Gazz. d. O. e d. C.*, August 22.

Oil Injected into the Vasa Deferentia, Resected for Prostatic Troubles.—The patient was a man 77 years old whose prostate was so hypertrophied that each lobe felt as large as a hen's egg by rectal palpation; for two years he had had difficulty in urinating. After bilateral section of the vasa Jaboulay continued by injecting iodoformed oil inserted without pressure into the peripheral and central end of each canal, ligating the four ends to prevent the escape of the fluid. A few days afterward the patient was able to urinate freely and the hypertrophy of the prostate had entirely disappeared.—*Semaine Méd.*, August 4.

Suppositories for Dysentery in Children.—Neutral sulphate of aluminum and potassium, 20 centigrams; lead acetate, .05 centigrams; cocoa butter, 20 grams; melted wax, 20 drops; to make 10 suppositories. Insert one every three to four hours. Especially beneficial after intestinal irrigation with a 1 per cent. solution of tannin, to which a few drops of Sydenham's laudanum are added.—T. Guida, *Semaine Méd.*, August 4.

The X-Ray in Food Inspection.—It has been found that with a little experience adulterations in tea, coffee, flour, beans, etc., and old and wormy nuts can be readily detected with the X-ray.—*Therap. Woch.*, August 22.

THE
Journal of the American Medical Association
PUBLISHED WEEKLY.

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SATURDAY, OCTOBER 23, 1897.

THE VISCERAL CHANGES IN EXTENSIVE SUPERFICIAL BURNS.

Many hypotheses have been brought forward to account for the constitutional symptoms following extensive superficial burns. Thus almost every writer on the subject advances a theory of his own as to their general pathology. Recently C. R. BARDEEN[1] reviews these various theories and finds it possible to group them somewhat like this: 1. Theories that involve the idea that burns are due to loss of normal cutaneous activity, especially as regards, *a*, the respiratory function; *b*, the perspiration; *c*, the heat regulating functions, and *d*, the protective functions. 2. Theories based on the idea that death is due to excitation of the nervous system, such as shock or reflex exhaustion and loss of vascular forces. 3. Theories urging death as due to cardiac paralysis caused by cooled blood, overheated blood or poisonous substances in the blood. 4. Theories that explain death as due to alterations in the circulation, because the blood is "driven in" by the heat (earlier writers), or because it accumulates in the peripheral vessels or on account of thrombosis. 5. Theories that claim the fatal result is due to alterations in the blood itself due to destruction or loss of function of red corpuscles. 6. Theories that attribute death to the presence of poisonous substances in the blood produced directly or indirectly in the burned areas.

"The clinical picture presented after extensive cutaneous burns is a striking one. The unfortunate victim, after a brief period of excitement and agony caused by the extreme pain, soon loses the power of much movement or resistance. The intelligence, at first fairly clear in spite of the great shock, gradually becomes beclouded. At times there may be delirium and cramps. The skin in the burned areas usually rapidly undergoes premature swelling. The pulse becomes very weak and rapid. . . . The respiration becomes rapid, irregular and shallow. The temperature, at first rising quickly above the normal, soon becomes subnormal in the rapidly fatal cases. There may be vomiting and diarrhea. The urine often shows traces of hemoglobin and albumin."

Now, after death, especially if this occurs soon after the burn, there may be no striking internal pathologic lesions, and irregularly distributed passive hyperemia of varying degree and small extravasations are often observed and cloudy swelling is usual. Occasionally gastric and duodenal ulcers are present. The blood shows well marked alterations, among which may be mentioned some rise of specific gravity, structural and also functional changes in the red corpuscles and a marked polymorphonuclear leucocytosis. Fragments of red blood corpuscles and blood pigment are found in the spleen, bone-marrow and lymphatic glands; thrombosis occurs occasionally in the capillaries and veins o some of the internal organs, and the majority of current text-books attribute death after burns to thrombosis.

Recently the view has become prominent that after burns toxic substances enter the circulation and cause the symptoms above quoted. This toxemia might be caused in various ways, but definite proof of the existence of toxic substances has not yet been offered. We know that in many infections and intoxications, spontaneous and experimental, certain quite typical lesions in the form of foci of necrosis may develop. BARDEEN'S demonstration[2] of similar areas of cell death in the lymph follicles after burns is therefore very suggestive and point, in truth, to the existence of a veritable toxemia.

BARDEEN had a chance to examine systematically the organs of five children that died at intervals of from four to nine and one-half hours after extensive cutaneous burns. Without going into details, the microscopic findings may be summed up as consisting of parenchymatous degenerations in the liver, the kidneys and the lymphatic tissues. Of these changes those in the lymphatic tissues are the most interesting because they were so widely distributed, because of their severity in spite of the short time between the death and the burn, and because of their specific and focal nature, pointing to the presence of toxic substances in the plasma. Thus there were found numerous areas of cell fragmentation essentially like those produced by the toxic substances in diphtheria in children as well as in experimental inoculations in animals with various so-called toxalbumins. The character of the lesions described by BARDEEN furnish, therefore, important additional evidence of a toxemia

[1] Journal of Experimental Medicine, vol. ii, No. 5, 1897.

[2] Loc. cit.

after burns; destruction of red blood corpuscles and thrombosis did not seem to play so prominent a part in producing death as did the poisons in the blood plasma.

THE PHYSICIAN'S PRIVATE DIAGNOSTIC LABORATORY.

The exactions of modern clinical diagnosis through the application of pathologic and bacteriologic methods have imposed new obligations upon medical practitioners. A few test-tubes and a spirit lamp no longer constitute a satisfactory laboratory outfit for a physician's office. To be abreast of the times, and to give his patients the benefit of the progress in medical science, a physician who conscientiously feels his obligations, must extend his laboratory practice far beyond the old confines of a search for albumin and sugar in the urine. The old microscope which has so long stood under the protection of a bell-glass, or has accumulated the dust of years in the closet, must be resurrected not alone to search for tube-casts and spermatozoa, but to take a place beside the thermometer and the stethoscope in daily practice.

The microscope, the test-tubes and the spirit lamp by no means constitute the requisite outfit. A number of additional pieces of laboratory equipment are required, until the office laboratory of the progressive physician becomes a miniature chemic, bacteriologic and pathologic laboratory. A small microtome and the centrifuge with its hematocrite are desirable; a simple sterilizer, incubator and paraffin bath are absolutely necessary; along with such glassware as test-tubes, flasks, slides and cover-glasses and a number of reagents. It fortunately happens that, aside from the microscope and microtome, the material necessary to equip a small working laboratory for purposes of clinical diagnosis is comparatively inexpensive, providing material of a simple character be chosen. A judicious outlay of $25 would supply the material necessary for a useful nucleus.

No doubt there are hundreds of physicians over the land who appreciate more or less keenly the desirability of employing laboratory methods in medical and surgical diagnosis, and to these individuals the item of expense in laboratory equipment would offer no obstacle. More serious objections are raised, and notably the one which confesses total ignorance of the methods of modern laboratory work. Here is indeed a serious stumbling block—one, unfortunately, which lies in the way not only of the older practitioner, but also before the majority of recent graduates in medicine, who imagined while they were in college that they were receiving "practical laboratory instruction," but who find themselves utterly helpless when the first tumor or the first case of diphtheria presents itself for diagnosis. The fault lies in an ignorance of laboratory technique which makes the would-be laboratory worker quite as helpless as one who aspired to do modern surgery while ignorant of the technique of hemostasis or of aseptic procedure.

How can this essential knowledge of laboratory manipulation be obtained? Obviously, by practice alone. This means that a reform should be inaugurated in a large portion of the laboratory instruction, as given today by medical schools, so that each student will be provided with a complete, simple laboratory outfit, and enabled to pursue all the steps of technical detail involved in an elementary study of such subjects as histology, bacteriology and pathology. Moreover, for graduates in medicine, identical courses should be offered involving the various methods of a laboratory diagnosis, until the steps in manipulation and the tools required become thoroughly familiar. Post-graduate laboratory courses should be made thoroughly practical in the full sense of the word, and thus attractive; and that army of graduates in medicine who are unfamiliar with laboratory methods should avail themselves of such courses instead of haunting the surgical and gynecologic clinics as is now the fashion. If more rural practitioners aspired to give their patients the benefit of a thorough diagnosis, and trained themselves for this purpose, the public and the profession would alike be benefited.

It is objected that laboratory work in medicine has become a specialty, and that it should be entrusted to the specialists in medical colleges, hospitals and boards of health. So far as advanced work is concerned this is true, and it is very desirable that laboratory specialism be recognized and duly encouraged. But there is no excuse for a physician who does not prepare himself to do the work demanded in routine daily practice. It would be quite as reasonable to argue that since there are cosmopolitan specialists in surgery no practitioner should open a boil; or because there are specialists in physical diagnosis no physician need possess, or perfect himself in the use of, the stethoscope and thermometer.

THE CONSERVATION OF THE OVARIES.

The reflex influence of the ovaries and testicles upon the animal organism has been so long a matter of common observation in the lower animals, that it would seem needless to offer any argument in favor of any question based upon it. The effects in the human species of castration in the male are also matters of common knowledge, but those of the corresponding operation on the human female seem to be still largely a matter in dispute. At least, such would be the inference from reading a discussion at the recent meeting of the American Association of Obstetricians and Gynecologists, reported in the October number of the *American Journal of Obstetrics*, where a paper on the conservation of the ovary, by Dr. B. SHERWOOD DUNN, was read and called forth various expressions

of widely differing opinion. Dr. DUNN opened his communication with a reference to the opinion of BROWN-SÉQUARD that every gland, ductless or otherwise, gives to the blood some useful product, the loss of which by its extirpation is more or less severely felt in the economy, and after alluding to the researches of MOND, CHROBAK, MAINZER and others, gave the results of his own observations upon one hundred cases of complete oöphorectomy observed by him in the Broca and St. Louis Hospitals in Paris. In 78 per cent. there was subsequent loss of memory, in 60 per cent. vertigoes and heat flashes, in 50 per cent. change of character. Forty-two cases suffered from mental depression and ten were close upon melancholia. In 75 per cent. there was diminution of sexual desire, and varying percentages had other inconvenient symptoms after the operation. The troubles were generally the more marked in women under 30 or 35 years of age, and the deduction was that the theory of BROWN-SÉQUARD had a substantial basis of truth, and that removal of the ovaries in women before the menopause was undesirable.

In the discussion that followed, Dr. DUNN'S views were supported by Drs. M. D. MANN, L. S. MCMURTRY and A. GOLDSPOHN, but the opinions of the majority of the speakers were more or less at variance with his ideas. It was held that castration did not make a woman feel unsexed, that conservatism often or even generally necessitated later operations, that the reported effects on the mental and emotional nature were not common and that the nervous and other symptoms described by the author of the paper were not observed in the general experience of gynecologic surgeons. Indeed, good results were claimed by some to be the more frequent the more thorough the extirpation, and the weight of opinion appeared to be against the conservatism recommended. The danger of the need of a subsequent operation was especially emphasized, and appeared to be, in the opinion of the majority of the speakers, a sufficient contraindication to such measures as the retention of a portion of the ovary that seemed unaffected by the disease requiring the removal of the remainder.

The psychic and physical consequences of castration in the male are so well known and evident that one would naturally expect to find something equivalent in the female from a like operation. It must be remembered, however, that these effects are less pronounced the later in life the operation is performed, and it is quite conceivable that many women who have suffered oöphorectomy after the full establishment of the sexual functions may feel no special loss of womanhood and exhibit no marked physical indications of the change. Conventional notions have also less play in regard to this deprivation in the female than in the male, and this, as Dr. CUSHING suggested in the discussion, as reported, has an important bearing. In the woman, moreover, it is only an anticipation of a physiologic change which occurs before a very advanced age, and which has no exact analogue in the male, at least to any marked extent. These facts may therefore be taken as legitimately modifying the estimate we should put upon castration in the female as compared with the same operation in the other sex. Having said this much, however, we have made all the legitimate allowance that is required for the operation when not imperatively demanded by disease, and the statistics offered by Dr. DUNN are abundantly supported by other evidence of the serious functional and organic alterations that are liable to follow the too early induction of the menopause by operative interference. When it is spoken of, as it sometimes is, as justifiable in young girls, or its consequences in such are made light of, one is excusable in reserving a doubt and questioning whether the operative furor may not have had too full play and there may not have been less than the full judicial consideration of the circumstances that ought to have been given. Women suffer many inconveniences and pains connected with their sexual organization that they do not report even to physicians, and it is perfectly within the bounds of possibility that many symptoms following oöphorectomy are overlooked by operators. It is not easy to suppose that the operation which, however slight in its consequences in later life, cuts off the whole sexual life of a female, can be entirely without unpleasant results.

The fashion, for such it has been at one time, of removing ovaries for hysteria and other conditions without actual organic disease, has no good excuse, unless it may be the Malthusian one or that of preventing a perpetuation of a degenerate stock—both of them rather questionable reasons for any such procedures. Any undervaluation also of the possible moral, psychic or physical symptoms following castration in women is a result to be deprecated. If we are to accept, which it is to be hoped is not the case, the general tone of the discussion referred to as indicating that such is a prevalent tendency amongst gynecologists, the fact is one that is to be regretted.

RACE PROGRESS AND RACE DEGENERACY.

A paragraph has been going the rounds of the lay press stating that a distinguished paleontologist and professor in Yale University has pronounced that the Japanese at the present day possess the largest brains, and that therefore they are the coming race that are to rule the world in the near future. Whether he is correctly quoted or not can only be told by seeing his original publication, but the proverbial accuracy of the daily papers in publishing sensational items leaves an uncertainty in regard to this point. On top of this however, we find in a recent work by a presumedly prominent anthropologist, Prof. CHAS. PEARSON, that

in his opinion the dark-skinned races are destined to outlast the lighter or Aryan group, and still another anthropologic specialist pronounces the opinion long since favored by certain of his European confrères, that in this country we are reverting to the type of the red man, thus affording us Americans at least a chance to get into the ranks of the majority when Truthful James' question as to whether the Caucasian is "played out" is finally answered in the affirmative.

Possibly, however, the future of the human race is not so altogether dark; there may be something better ahead than these scientists can forsee, that is, looking at it from our point of view. Just now it seems to be the fashion to take a pessimistic view of things; the times are out of joint to a large class of modern thinkers on social and other topics, and this may be only one of the signs of the times in this particular line. Degeneration of individuals and races is much more the theme of popularizing writers at least, and these prophecies may be rather incidents of the prevalent tendency than the results of the fullest scientific consideration of all the facts and possibilities.

It is a well-known and established principle that race progress and race retrogression depend rather on adaptation to environment than directly on cerebral development, however marked that may be. Europeans degenerate in the tropics and the Aryan Hindoo with all his metaphysical subtility, is, in all essentials, an inferior to his more practical Anglo-Saxon rulers. In the human species, moreover, the law of natural selection is only in part efficient; to a certain extent it is annulled, as LAWSON TAIT and others have long since pointed out, and there are a host of moral, social and political conditions that make or mar its progress. The environment therefore is a complex of conditions, only a small part of which are so thoroughly understood as to afford a basis for foretelling the outcome of any race or people beyond their immediate future. A scientific authority will hardly add materially to his reputation by venturing such prophetic utterances, except it be avowedly as a mere tentative opinion.

A recent French writer, Professor SCHRADER, has, in the *Revue Mensuelle* of the Paris School of Anthropology, offered some views in regard to this question of race advance or retrogression that are at least hopeful as to the future possibilities of what we have been accustomed to call the inferior races. He holds that, given a better environment, the most inferior race may become superior to all others, and that a race long resident in a certain *milieu* becomes best suited to it and, granted equal facilities, has the advantage over all others there resident; as an example he refers to the native population of Mexico, which though conquered and oppressed for centuries is now rising and furnishing the ruling class again in their country. There appears to be a degree of truth in this last statement, but the view he with others seems to hold, that the climate and soil affect the race type to produce that most suitable to them, which is that of the aboriginal inhabitants, is less encouraging. "Is it an illusion," he says, "that reveals to us in the physiognomy of the Yankee the hard bony face of the redskin?" This generalization of the idea that physical environment molds the human type is a favorite one with some European anthropologists, and its particular application is almost invariably made to this country and its European descended population. The physical peculiarities of the American aborigines are, after all, not so altogether objectionable; we can endure at least the contemplation of this prophesied fate of our race in this country, when we think of that of the portion of it that has displaced the Bushman and the Hottentot.

Speaking seriously, however, it may be repeated that speculations of this character are too indefinite and uncertain to be depended upon; they are much like Mark Twain's figurings on the length of the Mississippi—attempts to furnish the largest returns of theory from a minimal investment of facts. When in the distant future they, or anything like them, come to realization it will be as probably the result of factors not yet imagined as along the lines fancied by these prophets of science of the present. It is perfectly possible even that events may occur, as they have in the past, to check civilization and put the world some steps backward in its march, but it does not seem very probable that any very serious retrogression is at present imminent or that the inferior races are just now very rapidly coming to the top. It is safer and really more scientific to watch developments and to let such uncertain generalizations from the limited facts alone.

CORRESPONDENCE.

Treatment of Typhoid Fever.

CLEVELAND, OHIO, Oct. 12, 1897.

To the Editor:—Will you permit me to second the wise suggestion which appears in the JOURNAL, of October 2, under the caption "A Way to Settle the Respective Merits of the 'Brand' and 'Woodbridge' Treatment of Typhoid Fever." Permit me, also, to assure your correspondent that I cheerfully accept all of his conditions and I will meet such a commission as he advises, whenever it may command my services and wherever it may choose to hold its sessions, whether in some typhoid stricken city in the United States, in England, on the Plains of Thessaly, or wherever the disease may occur; only show me the patients and I will supervise the treatment of as many cases of typhoid as may be necessary to enable the commission to make a *final* and *decisive* report. No one shall be taxed either for my services or for my expenses.

With the possibility of verifying the clinical diagnosis of typhoid fever by the diazo-reaction of Ehrlich and by the serum test of Widal, it ought to be possible to "settle" this much discussed question at once and forever. After having expressed myself in full accord with "M." on all of the essential

points of his communication will he permit me to enter a mild protest against the, no doubt, unintentional injustice of including me in the deprecation of "the redolent with personalities" phase of a recent controversy. No one can abominate more than I do the "bitter personalities," yet it has been my lot to have been the recipient of more captious, unreasoning and even insulting criticisms, than perhaps, any other living man, and I would have been more than human or less than man if I had not resented some of them, but I appeal to the medical profession to witness that even in the heat of debate, and under the provocation of the grossest misrepresentations my speeches and my written communications have always been as free as possible from "offensive personalities," even in the controversy to which "M." alludes. I did not correct the erroneous statements or false inferences which referred to myself alone, although some then were calculated, if given credence, to do me grievous harm and as soon as the "mud pelting" was directed toward me alone, I at once *dropped* the correspondence.

Again placing myself at the command of the commission suggested by "M." I remain

Your most obedient servant,

JOHN ELIOT WOODBRIDGE, M.D.

Woodbridge Versus Typhoid Fever.

SAN DIEGO, CAL., Oct. 9, 1897.

To the Editor:—I heartily concur with your correspondent "M." that the time is opportune to determine the status of Woodbridge's method as an abortifacient of typhoid fever. Certain it is that no just conclusion can be attained through acrimonious discussions in the medical journals, and meanwhile, possibly, humanity suffers. I would therefore suggest an appeal to the Académie de Médecine of Paris, members of which would doubtless be willing to pass upon a subject of such importance. There hospital and other facilities are unsurpassed, and it is well known that in times past its members have solved many problems of interest to the medical and scientific world.

For example, says Pareira, homeopathy has been fairly put to the test of experiment by some of the members of the Académie, and the result was a failure. Andral tried it on 140 patients, in the presence of the homeopathists themselves, adopting every requisite care and precaution, yet in not one instance was he successful!

At a later period, I believe members of the same distinguished body, with the active concurrence of Gull and Spurzheim, investigated the claims of phrenology and declared many of them untenable.

Within the recollection of the writer, specimens (roots) of the sarracenia purpurea, at that time a much vaunted remedy for smallpox among whites and Indians of Canada, were forwarded to the Académie and after a thorough trial were found to be inert.

I propose then that Parke, Davis & Co., already widely and favorably known for their interest in the advancement of materia medica, etc., transmit the necessary literature and a sufficiency of their Woodbridge tablets to the Académie de Médecine, requesting a thorough investigation of their possibilities in typhoid fever. I am sufficiently interested to assist in paying the expense if necessary. C. M. FENN, M.D.

An Interesting Case.

FORT SMITH, ARK., Sept. 28, 1897.

To the Editor:—In 1895, while in charge of the U. S. Jail at this place, I treated a very interesting case. A strong, robust young man, during the progress of a fight, received a severe contused wound about two inches in length and laying bare the frontal bone just over the right eye, which in spite of the ordinary antiseptic treatment proceeded to suppurate very freely, and, notwithstanding bichlorid douches and iodoform dressings were faithfully employed, the process was not stayed, but rather increased. On the third day after the injury, in an insignificant little scratch on the cheek two or three inches below and to the outer side of the eye, erysipelas developed and rapidly spread until the whole face was involved, and at the second removal of the dressing after the wound became involved in the erysipelatous process, I found it firmly sealed by a dry scab and presenting no evidence of pus. Being anxious to see the outcome this was not disturbed and the face was lightly covered with absorbent cotton saturated with bichlorid of mercury 1 to 2,000, which application I had been using in the treatment of the erysipelas. Now from this fourth day there was not an untoward symptom or a drop of pus in or about this wound, and when the scab dropped off I found a nicely and perfectly cicatrized scar. The stitches were allowed to remain in the wound nineteen days, and when removed, notwithstanding there had been stitch abscesses developed during the first two or three days, were found firmly inpacted in the tissues, requiring some little effort in their removal, and I firmly believe had they not been reinfected from without they would have remained indefinitely in the tissues without producing any irritation or inflammation.

This case was reported at the time at our local medical society with the prediction that a toxin would be found which when introduced into the body would be fatal to the germs of suppuration and infection, and it seems that my prediction is thus early about to be verified. W. R. BROOKSHER, M.D.

Report of Three Cases of Asphyxia from Submersion.

GREENVILLE, TEXAS, Oct. 16, 1897.

To the Editor:—I deem it necessary to preface this letter with some preliminary remarks bearing upon this unfortunate affair. These cases consisted of one prominent wealthy man, and two young women. There are various rumors and fine-spun theories by the laity, relative to the causes and reasons why this drowning occurred.

The examination of the bodies was not made at the place of drowning, which was due to oversight on the part of the coroner. I was summoned to make examination of the bodies after they were brought to town, which was about ten hours after the accident.

I obtained the following facts from reliable members of the searching party, as follows: The drowning occurred Wednesday about 10 P.M. on June 18, 1897, about six miles northwest of Greenville, in a "pasture pool." There were two men and two women, and one of the men was fortunate to escape alive and report the affair.

One of the searching parties arrived from the neighborhood about two hours afterward and they observed one of the bodies floating. The searching party from Greenville arrived upon the scene about 1 A.M. and immediately removed the floating body, it being in shallow water. Rigor mortis had not set in in this case. The other two bodies were not removed until 4 A.M., and they were found in ten feet of water and rigor mortis had taken place. I made a careful examination of the bodies and found that all three of these cases presented practically all the external signs of asphyxia due to submersion and gave my opinion, based upon the statement of the only eye witness and searching parties, that they met their death by accidental drowning.

The special point of scientific interest was why one of these bodies was found floating two hours after accident, and two were at the bottom of pool. The floating one was found in about five feet of water at an inclined angle, with the face at the surface of the water. The other two (the man and the

most corpulent woman) were close to each other in about ten feet of water at the bottom of the pool.

These people drowned at the same time in close proximity to each other in the same pool. The water was clear and not stagnant, and the temperature of air and water was the same for each case. The women had on loose wrappers and the man an undershirt and an old pair of trousers when found.

The time for submerged bodies to float depends upon such varied conditions that no absolute period can be fixed for all cases.

It is my purpose to call attention to the unusual occurrence of one of these bodies floating at least two hours after the accident.

The specific gravity of a human body is slightly heavier than water, and it will not float immediately. I present the following reasons as the cause of this body floating:

1. She was found in shallow water, and the weight of the superimposed water may have kept the other two bodies from rising.

2. The body being in shallow water, putrefaction, with formation of gases, would be more apt to take place than in those completely submerged.

3. I learned from a colleague of mine that this person was being treated for fermentative or flatulent dyspepsia, and this, in connection with beverages and lunch prior to bathing, may have caused excessive formation of gases in the stomach, also in the small intestine.

4. If no water was taken into the lungs and she died with the lungs full of air, then the specific gravity of the body would be made lighter than otherwise.

The day after the inquest, it was alleged by some of the laity that the reason the woman floated was due to pregnancy. I am not in a position to state whether she was in that condition, as a postmortem was not made. Now to the point: Will a pregnant woman be more liable to float than if she was not pregnant, conditions being the same?

J. R. NICHOLS, M.D.

Goat's Blood and Milk.

Reply to Dr. Parker's Inquiry as to the Use of Goat's Blood and Milk in the Treatment of Disease. Translated from the French (Transactions Congress for the Study of Tuberculosis, Session of 1891.)

NEW YORK CITY, October, 1897.

To the Editor:—"In a work published last year we have shown that it is advantageous to substitute the goat to the cow for vaccinating purposes. The goat is refractory to tuberculosis, not when she is inoculated only, but in the ordinary tenor of its existence. When rabbits were inoculated with tuberculosis, if goat's blood was transfused into them the same day, these rabbits resisted inoculation; if the transfusion was strong after inoculation the tuberculous processes retrograded and were cured. The transfused goat's blood determines then, in the rabbits, a bactericide condition. Could not it act similarly on man? As the transfusion of animal blood to man was not without danger, we recurred to subcutaneous injections or even intramuscular injections of goat's blood, complete and fresh. The injections were of 15 to 20 gr. and repeated three or four times in the same patient with intervals of ten to fifteen days. Of 110 patients, 10 had abscesses, 50 to 60 urticaria. The patients who suffered with laryngeal phthisis reaped no benefit from these injections; in the cases of pulmonary caverns there were some ameliorations. The amelioration was evident in the cases of tubercular bronchitis, tuberculosis of the first degree, ganglionary tuberculosis, osseous tuberculosis and the lupus."—Bertin and Picq.

TRANSFUSION OF GOAT'S BLOOD IN PULMONARY TUBERCULOSIS.—"The goat is refractory to tuberculosis as I have seen by the autopsies of forty-eight individuals and by the injection (intravenal) of bacilli into four others. While the rabbits inoculated with tuberculosis die within two months if they are left without treatment, those injected with goat's blood die less quickly, and those into which this blood is transfused present caseous foci but without generalization. I have satisfied myself by other experiments that the transfusion of blood from one animal to the other is not dangerous. I have, therefore, transfused goat's blood into man. The apparatus which I used consists of two trocars, joined by a rubber tube; the one, rather voluminous, is introduced into the carotid of the goat, the other, capillary, into the cephalic vein of the patient; 100 to 120 grams of blood may be transfused in one minute. The first sittings must not last longer than fifteen to thirty seconds, the subsequent ones more than one minute. I have thus treated two chloro-anemics, who were cured; seven tuberculous of the second, one of the first degree, who may be considered as cured, inasmuch as their general condition is good and the physical symptoms as well as the bacilli have disappeared; three more tuberculous who were ameliorated; finally two, who at first ameliorated, have since died rather rapidly. A last patient who had reached the last degree of cachexia, died of syncope in the course of the transfusion."—M. Bernheim.

IMMUNITY AGAINST CHOLERA BY GOAT'S MILK.—M. Gamaleia presents a work on the immunity against cholera imparted by the milk of goats, composed on his advice and under his direction by Dr. Ketscher of St. Petersburg. In the present time the pandemic extension of cholera has specially directed the efforts of bacteriologists to discovering effective means of combating this scourge. Thus have been imagined of late, divers methods of vaccination, which have more or less in common with the well known studies of Ferrau. But despite the innocuousness of most of these methods they have not been practically applied even during the most devastating epidemics, as that of Hamburg; for preventive vaccination is not a national measure, adapted to a struggle against an acute disease like cholera, which affect only a minority of the population. The less so that bacteriology, not content with its ability to obviate infectious diseases, has made important progress, allowing it to defeat even declared affections. Everyone knows something about serotherapy, or the treatment of infections by the serum of vaccinated animals. But the use of serum presents a certain number of drawbacks which hinders its introduction into practice, especially for cholera. Another immunizing fluid furnished by the vaccinated animal's milk is without any of them. It is for this reason that M. Ketscher has studied the immunizing properties of milk in cholera. For these experiments he has employed the most virulent cultures of cholera, sent him from Massua. The goats were vaccinated by subcutaneous, intraperitoneal and intravenous injection of these cultures. The immunizing power of their milk was observed in the following series of experiments by means of its introduction into the peritoneum of the guinea pigs. The chief results of his experiences are as follows: The milk of the vaccinated goat injected at the doses of 5 c.c. has the property of vaccinating the guinea pigs against a mortal dose of cholera (½ c.c. injected into the peritoneum). The guinea pigs which had received the milk remained well, while the witnesses succumbed in the first six to ten hours after the inoculation of the virus. In order to make out whether the milk acts only directly upon the cholera vibriones or also upon the whole vaccinated organism, M. Ketscher varied his experiments by injecting the cholera cultures in another place than in the peritoneum, especially in the muscles of the posterior extremities; this mode of infection gave exactly the same results as the preceding. The guinea pigs prepared by the milk lived, the witnesses succumbed six to eight hours after the infection. These experiments show that the milk of vaccinated goat injected into the peritoneum of the guinea pigs renders them refractory to a mor-

tal dose of cholera. It is not without importance to add that the milk of the non-vaccinated goats, which M. Ketscher has repeatedly tried, possesses no immunizing power. By another series of experiments he has studied the curative power of milk. For this purpose he injected a mortal dose of cholera into the muscles or peritoneum of the guinea pigs and then treated them by the intraperitoneal introduction of goat's milk. In these cases the guinea pigs treated showed some symptoms of infection, for instance, a slight edema on the inoculated thigh. But these symptoms vanished altogether in a short while and the guinea pigs survived. The witnesses invariably perished. It follows that the milk of a vaccinated goat injected into the peritoneum of guinea pigs not only vaccinates them against future infection, but cures even the declared disease."

ALBERT S. ASHMEAD, M.D.

Surgical Treatment of Impotence.

CHICAGO, OCT. 9, 1897.

To the Editor:—In your JOURNAL of Oct. 9, 1897, you published an article by J. A. Murray, M.D., entitled "Ligation of the Dorsal Vein of the Penis for Functional Impotence With Report of five Cases."

In this article the Doctor states that he has seen no literature on the subject, but further says that he does not claim priority of discovery for the operation.

The first case reported advocating this operation was by Dr. Waugh formerly of Philadelphia, and now of this city, in the *Southern Clinic*, 1893, Vol. xvi.

In 1893 I did the operation for the first time after having seen Dr. Waugh's article, and have since then performed it twice. In all three cases I had good results.

EVERT E. TRACY, M.D.

NECROLOGY.

SURGEON GENERAL NEWTON L. BATES of the navy, the President's family physician, died at the Shoreham hotel, Washington, D. C., October 18, at half-past nine, of a renal trouble. He was appointed Surgeon General about two weeks ago, to succeed Surgeon General Tryon, and was obliged on account of the illness which finally resulted in his death to take the oath of office in bed. He entered the navy from New York State in June, 1861, and prior to his appointment as Surgeon General was a medical director, with the relative rank of Captain, and was on duty at the Naval Museum of Hygiene in Washington.

RODOLPHE HEIDENHAIN, M.D., incumbent of the Chair of Physiology at the University of Breslau, according to a cablegram dated October 14, is dead. He was born at Marienwerder, Jan. 19, 1834, studied medicine and natural science at the Universities of Koenigsberg, Halle and Berlin, and after receiving his diploma in 1854, entered the laboratory of Professor Du Bois-Reymond, under whose direction he conducted his researches in experimental physiology. He was appointed to the chair of Physiology at Breslau in 1859. Among his best known publications are: "Studies in Physiology," "The Physiology of Secretion," "Animal Magnetism, so-called," and "Vivisection Applied to Medical Art."

WALTER E. ANTHONY, M.D., New York University, 1867, at his home in Providence, R. I., aged 50 years.——Oliver M. Doyle, M.D., University of Pennsylvania, 1856, died at Calhoun, S. C., October 6.——George R. Hunt, M.D., at Warrensburg, Mo., October 4, aged 73 years.——Timothy D. Connor, M.D., Springwater, N. Y., October 8, aged 65 years.——Richard D. Cowan, M.D., Rolla, N. D., October 7, aged 42 years.——Theodore Munro, M.D., Union, S. C., October 10.——Vespasian Smith, M.D., Duluth, Minn., October 11, aged 79 years.——Andrew J. Spalding, M.D., Leonardtown, Md., October 5.

PUBLIC HEALTH.

Yellow Fever.—The dispatches of the 12th closed our record in last week's JOURNAL. This week we have the following data: October 13.—New Orleans, 9 deaths, 27 new cases; Mobile, 7 new cases in the city proper, and 6 brought in from Magazine Point; Wagar, Ala., 1 death, 1 new case; Nittayuma, 1 new case; Edwards, 3 new cases and and 1 death, October 14.—New Orleans, 4 deaths, 41 new cases. The "suspicious" cases at San Antonio, Tex., were on this date claimed not to be yellow fever, and there were no new cases at Galveston. Mobile, 5 new cases, 1 death; Flomatom Junction, Ala., 8 cases; Franklin, La., 1 death; Bayminette, Ala., 1 death; McHenry, Miss., 6 cases; Edwards, 6 cases; Clinton, 1 death; Biloxi, 13 cases and 1 death. October 15.—New Orleans, 44 new cases, 3 deaths; Mobile, 5 new cases. October 16.—New Orleans, 22 new cases, 1 death; McHenry, Miss., 1 new case; Edwards, 5 new cases, 1 death; Nittayuma, 1 new case; Cayuga, 4 new cases; Mobile, 7 new cases; Wagar, Ala., 1 death. October 17, the deaths at New Orleans numbered 5, with 24 new cases; Bay St. Louis, 7 new cases and 1 "suspicious" case. October 18, the death list at New Orleans reached the hundred mark, as 7 deaths were reported on this date. The new cases numbered 37, bringing the total cases at New Orleans, to date up to 865, of which 322 are still under treatment. At McHenry, 2 new cases were reported; 12 new cases at Scranton; 2 new cases at Pascagoula; 16 new cases at Biloxi; Mobile, 6 new cases, and 1 death, making the total cases there to date, 170, and the total deaths, 22. Cayuga reports 2 new cases and 2 "suspicious" cases, with 1 death. Edwards reports 2 new cases, and 3 deaths. Montgomery, Ala., reports 2 cases, with a few "suspicious" cases. Franklin, La., 2 cases, and 1 death near Patterson, La. Dispatches of October 19 give no encouragement in the situation at New Orleans, there being 56 new cases and 4 deaths reported.

The Cost of the Yellow Fever.—Although there has been comparatively little loss of life in yellow fever districts of the South, there has been a tremendous loss of money to the community because of the contagion. The New York *Herald* says it is estimated that the loss to the business men in New Orleans alone will amount to $25,000,000, while the losses in other directions and the cost of maintaining the quarantine will run the total up to $38,000,000. Most of this loss is the result of the wild and unreasonable excitement of the neighboring towns and villages that have shut off all supplies shipped from New Orleans and have absolutely paralyzed business in that city.

Typhoid Fever and Damage Suits Against Municipalities.—The *Lancet* remarks that the city fathers of Yarmouth, England, have, by a narrow margin, escaped being mulcted in damages for having been the unwitting means of causing fatality by typhoid fever, in the course of their construction of a very necessary sanitary improvement, which was intended to have a precisely contrary result. The Court of Queen's Bench was occupied for three days in hearing the evidence on this point. It appears that a new sewer was being laid down in Queen street, and that shortly afterward a resident in this street complained that the water in a well situated in the basement of his house was foul and that he and others had been made ill by its consumption. He attributed the contamination of the water to percolation of sewage, which was alleged to have found its way into the trench dug for the reception of the new sewer. A month later the complainant, Mr. Durrant, sickened with typhoid fever, from which he died. An action was brought by his executors claiming damages from the corporation for having, through their negligence, caused the pollution of the well and the death of Mr. Durrant. Without entering into the question as to whether the consumption of this water was

the cause of his fatal illness or not, and even admitting this possibility, the defence went to show that the well could not have been contaminated by the temporary disturbance of the soil thirty-six feet distant, but that it was, and probably had been long fouled by leakage from a privy situated at a higher level, only sixteen feet away. For after the well had been daily pumped out for a month the water remained still highly impure. As Mr. Justice Hawkins remarked, the poisonous contamination of the well was a singular coincidence at the time of the progress of the works, and the jury gave a verdict for the defendant.

The Home in Its Relations to Tubercular Consumption.—Dr. R. Thorne Thorne, in the "St. Bartholomew's Hospital Reports," thus states the case as to phthisis in the domicile: Conditions of dwelling house tending to the promotion of tubercular consumption.—1. A soil either naturally damp and cold or subject to the influence of the rise and fall of a subsoil water lying within a few feet of the surface. 2. A dwelling house of which either the foundations, the area they inclose, or the walls are, by reason of faulty construction or otherwise, liable to dampness. 3. Such immediate surroundings of the dwelling house as tend to prevent the free movement of air about it, and its ample exposure to the influence of sunlight. 4. Such structural defects as would prevent the maintenance within all parts of the dwelling house of ample movement of air by day and by night, and free exposure of its habitable rooms to daylight.

Conditions of dwelling house tending to the prevention of tubercular consumption.—1. A soil which is dry naturally, or freed by artificial means from the injurious influence of dampness and of the oscillations of underlying subsoil water. 2. A dwelling house so constructed as to be protected against dampness of site, foundations and walls. 3. Such open space on at least the two opposite sides of the dwelling house as shall secure ample movement of air about it, together with its free exposure to the influence of sunlight. 4. Such construction of the dwelling house as will secure for its habitable rooms, and throughout its interior, free movement of air by day and by night, and free access of daylight.

On the Convection of Plague by Merchandise.—The editor of the *Lancet* considers the above subject in a leader designed to set forth the kind of proof that is offered to prove the affirmative of the question as against merchandise, such as cotton, wool, etc., from the Orient. At the present time, when we read of the action of certain European powers in respect to cargoes of cotton from plague-invaded ports, it may not be out of place to inquire briefly on what evidence this fear of the importation of plague through the agency of such articles as cotton or wool is based. It is an easy matter to assume that when an infectious disease is prevalent within any given district, there may be fear of such disease being conveyed through the agency of merchandise from the invaded center; but when we ask upon what evidence this fear is based, we are not so easily supplied with an answer which is proof against destructive criticism. We read in the text-books, of plague having been conveyed from one place to another through the agency of bales of cotton or wool, but the evidence which is given as supporting this statement is, as a rule, somewhat scanty. Indeed, it seems that when some of these questions are approached in a spirit of unbiased inquiry there is but little evidence tending to support the text-book statements. For instance, among European nations the French are not behindhand in their dread of the importation of infection through the agency of certain merchandise from infected Indian ports, but it does not seem that the French in taking up this attitude, are mindful of a certain report which was made to the French government in 1846, by a Special Commission appointed by the French Academy of Medicine, upon this very subject, and which report was brought before the Lord President of the Privy Council by Sir John Simon in 1875. In bringing forward the evidence adduced in this report, Sir John Simon pointed out that western Europe had not suffered from plague for more than one hundred and fifty years, and that up till quite recently the disease had been frequent in the Levant, from which plague-invaded district wool had in all times been exported without apparently any case of plague having been caused thereby. We are far from asserting that it is impossible for plague, when its virus is in a certain phase of activity, to be conveyed through the agency of cotton or wool, but in endeavoring to arrive at any conclusion on this question the very important negative evidence furnished above should receive its due share of consideration; and it is to be regretted that articles on plague in the text-books are, for the most part, silent as to the conclusions of the French Commission, although at least sufficient prominence is given to "reports" in the other direction. If action were taken upon the statements contained in some of the text-books, it is conceivable that under certain circumstances much misery might be produced in some of the manufacturing districts of England, loss and misery which would be, perhaps, hardly justified upon the evidence obtainable on this point.

The Malarial Hand.—Dr. Edward Craster, a governmental officer, resident on the West coast of Africa, invites attention to a diagnostic coloration of the hand that is, in his opinion, malarial in origin. He says, in the London *Lancet*, for September 4: "It is well known that long residence in a malarial climate causes, in a large majority of cases, such changes in the coloring matter of the skin that, instead of 'sunburn' a peculiar 'putty-like' appearance is produced. With some this appearance disappears after a short residence at home, with others it is permanent. This 'West-coast complexion' is so commonly recognized as to need no comment here. The peculiar phenomenon to which I wish to draw the attention of the profession is one which I have called 'the malarial hand.' I have noticed during my sojourn in the Niger territories, among those Europeans who have resided on the Niger more than two years, a singular rose-pink coloration of the skin over the thenar and hypothenar eminences and also over the under surfaces of the last phalanges of both hands. This coloration comes on imperceptibly and increases gradually until the appearance is as if these surfaces had been dipped in red ink. I have not noticed it in persons of any particular complexion, but it seems to affect fair and dark alike, and it always appears simultaneously on both hands, never on one alone or on one before the other. It would be very interesting to hear if a similar manifestation exists in other malarial climates, and if so to what it has been ascribed. Personally I am not yet in a position to give an opinion on the subject, but would be much interested to hear that of confrères who have noticed the peculiarity."

SOCIETY NEWS.

The Newport Sanitary Protective Association met at Newport, R. I., October 8. The following were elected officers for the ensuing year: President, Elbridge T. Gerry; first vice president, James J. Van Alen; second vice-president, A. B. Almon; treasurer, Peter F. Curley, M.D.; recording secretary, Creighton Withers; corresponding secretary, H. R. Storer, M.D.; honorary counsel, Samuel R. Honey; consulting engineer, George E. Waring, Jr.; inspectors, William H. Chapman and George W. Farquhar.

The National Sanitary Association met at Nashville, Tenn., October 13. Papers by Dr. Charles S. Benedict, Dr. Thomas C. Craig and President Young were read and discussed. The Association elected the following officers: President, Dr. Charles E. Benedict; vice presidents, Dr. H. C. McLean and Dr. F. L. Jewett, both of Brooklyn; Dr. E. A. Wilson, Meriden, Conn.; secretary and treasurer, Dr. Thomas E. Veal of Atlanta, Ga. New York City was selected as the next place of meeting.

MISCELLANY.

Personal.—H. Augustus Wilson, M.D., has severed his connection with the Polyclinic Staff, Philadelphia.

New Journals.—*Edwards' Journal of Health*, Vol. i, No. 1, October, 1897, has been received. It is edited and published monthly by Joseph F. Edwards, A.M., M.D., Atlantic City, N. J. *The National Hospital and Sanitarium Record* is a new publication published in Detroit, Mich., Vol. i, No. 2, September, 1897, being noted among our exchanges.

Death from Ivy Poisoning.—A death is reported from Chester, near Middletown, N. Y., from rather an unusual cause, the effects of ivy poisoning. The patient was a female, 69 years of age, who came in contact with the plant early in July. Her whole system seemed to be profoundly affected by the poison and death resulted after two months of great suffering.—*Boston Medical and Surgical Journal.*

Not an Unreasonable Contract.—There is no manifest unreasonableness, the supreme court of Rhode Island holds, Tillinghast vs. Boothby, in such a contract as one by which a certain person was employed to work as a dentist, with a stipulation that he would not, after the termination of the contract, "either directly or indirectly, carry on, or be employed or concerned in, the practice of dentistry in the county of Providence, Rhode Island."

Intracorpuscular Parasites in Birds.—Danilewsky, who first observed intracorpuscular parasites in the blood of birds, believes that these organisms are identical with those of the malarial fevers. Certain subsequent observers have attempted to establish an analogy between the different varieties of the malarial parasites and forms which they find in birds. Others have considered the parasites in birds to be entirely independent of those of man. It seems probable that there are in birds at least two distinct species of intracorpuscular parasites. In almost every detail of structure they very closely resemble the malarial organisms of man, but they are, nevertheless, essentially distinct.

Observation of Conduct.—In Burt v. State, a murder case, where the defense was insanity, the court of criminal appeals of Texas says that it is not informed of any case holding that because a prisoner is in jail, unwarned, therefore his conduct can not be observed, so that an expert can give an opinion as to his sanity. It would be a remarkable case, indeed, the court goes on to say, in which the accused, if insane, would simulate sanity. Nor can it comprehend how the fact that he was in jail could affect his conduct in this particular in any manner. Consequently, it holds that the testimony of a medical expert who has carefully observed the conduct of a prisoner under such circumstances is admissible in evidence on the question of his sanity.

A Diagnostic Point Worth Knowing.—A young physician of East Liberty, who was called to see a consumptive patient in the absence of the family doctor, was asked by the patient's sister, in anxious tones: "Doctor, are consumptive persons full of bugs?" "Bugs?" repeated the physician, doubtfully. "Yes; our doctor says they are full of bugs." "Oh," he replied, "your doctor probably told you of the bacilli tuberculosis, but they can't be called bugs. They are very small creatures. I forget their exact size, but it would take probably 10,000 to make an inch, and they can not be seen except by the highest power of the most powerful telescope." The questioner listened doubtfully and then said: "Well, anyhow, my sister can feel them crawling inside her."—*Pittsburg Chronicle-Telegraph.*

Statements to Physicians.—The Court of Appeals of Kentucky takes the position, in the case of Omberg v. United States Mutual Association, that the declarations of a patient to his attending physician with regard to what his injury is or was caused by are competent evidence where the cause of his injury is in issue. A narrative of the events attending the mishap, it goes on to state, would not be competent, but the patient may tell what the injury is, if he knows. He is suffering, and is seeking relief. To get it he must tell the truth. Any other course would mislead his physician, and might result disastrously. But the court says that it is not disposed, for obvious reasons, to extend this doctrine so as to embrace declarations made to others than the patient's physicians.

Rectal Feeding in Typhoid Fever.—For some time past Dr. Queirolo, Professor of Clinical Medicine in the University of Pisa, has been in the habit of feeding his cases of typhoid fever entirely by the rectum in order to afford the diseased bowel complete rest. The nutrient enemata are given four times daily, and consists of triturated meat and pancreas with a few drops of laudanum, each injection being preceded by irrigation of the bowel with boracic acid—the plan, in fact, advocated by Leube. The patients are allowed to drink hydrochloric acid lemonade. In this way the digestive tract is preserved from putrescible substances, and this Dr. Queirolo considers obviates one of the most fruitful sources of auto-toxic action. All the cases treated on this system, many of them a very severe type, are stated to have recovered.—London *Lancet.*

A Danger from the Underground Wire.—Electrolysis is damaging the water-pipes at Springfield, Mass., as well as elswhere. A water engineer of that city in describing a volt meter test of an affected pipe, says: "To my mind the solution of these queer antics is that the return wire at the point where the current showed was not as good a conductor as the iron pipe which runs along Belmont Avenue. When the current neared the pipe which we are discussing, the ground was wet and the current left the main pipe and entered this one. The current does no harm so long as it runs along the pipe, but when it leaves the pipe for some other connection it raises mischief. Iron pipe is affected as badly as lead pipe. Sometimes a pipe will be ruined in three or four weeks. In Brooklyn, cases have been reported where three or four days have spoiled the pipe. But this is not a circumstance to what happened on State Street. There a pipe had been cut off and plugged in close proximity to another line. The amount of electricity in the plugged line pipe was something remarkable. I took and wired a pen to it and held it with a rubber mitten, and it would emit sparks two or three feet long. I then held the pen a short distance from the second line of pipe and found that I could mark the pipe, in fact, could write my name as easily as a diamond writes upon the glass."

Power of Railway Officials to Employ Physicians.—A judgment for the value of medical services rendered railway employes was affirmed by the appellate court of Indiana in the case of Bedford Belt Railway Company v. McDonald. The court said that a railway corporation is under no different obligation to procure medical and surgical aid for its employes than is any other corporation or person under like circumstances. At the same time it is well settled that the general officers of a railway company have power to employ medical attendance for workmen injured in the performance of duty in the company's service. Subordinate officers or agents can only do so in cases of urgent exigency. The court further said that it failed to see any difference, in effect, between a corporation, through its general officers, employing a surgeon at the time an employe is injured and employing him in advance to render services to an employe only in the event that the employe is injured. But it would not decide here whether a corporation has power to employ a surgeon at a stated salary, which he is to receive in any event, though it stated that it did not consider that such a contract would be against public policy or an invasion of the rights of injured employes. There can be no presumption that the amount paid the surgeon by the company is deducted

from the wages of the injured employes, nor that such a contract as the foregoing cuts off the right of an injured employe to call in any surgeon he may choose.

Termination of Liablity for Care at Hospital.—St. Barnabas Hospital v. Minneapolis Electric Company, is the title of an action brought to recover for the care and treatment of one of the employes of the defendant company, whom it had taken, after he had been seriously injured, to the hospital named, where he was received as a patient for an indefinite period, no length of time being mentioned, at the company's request and upon its promise to pay for his care and treatment. Subsequently, and while the patient was yet incapable of being removed or discharged from the hospital without great danger to his life or health, the company gave notice that thereafter it would not be responsible for his care or treatment. Could the company thus terminate its liability, especially at such a time? The supreme court of Minnesota holds not. It holds that under the circumstances it was an implied condition of the contract that the company could only terminate its liability by removing the patient or when he could be dismissed by the hospital without serious danger to his life or health. In order to relieve itself from liability for care and treatment furnished after the notice on the ground that the patient had means of his own to pay for it, the court further holds that the burden was on the company to prove that he had means out of which the hospital could and should have collected its pay. But for the hospital to maintain its action, the court intimates that the burden belonged to it to prove that the patient could not have been dismissed without great danger to his health or life until the date of his dismissal, or that at least it could not recover pay after the notice against the company beyond the time to which it proved that such condition extended.

X-ray Photographs as Evidence.—In the course of the trial of the personal injury case of Bruce v. Beall, a medical expert, Dr. Galtman, was introduced as a witness, and he was permitted to submit to the jury an X-ray photograph taken by him, showing the overlapping bones of one of the plaintiff's legs, at the point where it was broken by the fall which was charged to the defendant's negligence. This was objected to by the defendant's counsel. The photograph was taken by the witness, who was a physician and surgeon, not only familiar with fractures, but with the new and interesting process by which this particular impression was secured. He testified that this photograph accurately represented the condition of the leg at the point of fracture in question, and, as a fact, that by the aid of X-rays he was enabled to see the broken and overlapping bones with his own eyes, exactly as if stripped of the skin and tissues they were uncovered to the sight. After calling attention to these facts the supreme court of Tennessee says that it might, if it so desired, rest its conclusions on the general character of the exceptions taken to this testimony, but that it prefers to place it on the ground that, verified by this picture, it was altogether competent for the purpose for which it was offered. New as this process is, continues the court, experiments made by scientific men, as shown by this record, have demonstrated its power to reveal to the natural eye the entire structure of the human body, and that its various parts can be photographed as its exterior surface has been and now is. No sound reason was assigned at the bar why a civil court should not avail itself of this invention, when it was apparent that it would serve to throw light on the matter in controversy. Maps and diagrams, drawn by hand, and photographs of exterior surfaces have been admissible in numerous cases. It is not to be understood, however, adds the court, that every photograph offered as taken by the cathode or X-ray process would be admissible. Its competency, to be first determined by the trial judge, depends upon the science, skill, experience and intelligence of the party making the picture and testifying with regard to it, and, lacking these important qualifications, it should not be admitted; and, again, even when it is not conclusive upon the triers of fact, it is to be weighed like other competent evidence.

Insanity Abroad on the Increase.—There has been a deal of comment of late on the increase of insanity in England. It seems from an official report that a similar, if not a worse, condition of affairs exists in Prussia, where the lunatic asylums find difficulty in providing accommodations for the crowds of applicants for admission. In 1871 the total number of lunatics in Prussia was 55,063, in 1880 it had risen to 66,345, while in 1896 it had gone up to 82,850. It is interesting to note also that, while the growth of insanity is general, it is more marked among men than among women. Of 100,000 Prussian males it seems 278 are found insane; but in a like number of women only 243. From figures given in the same return it appears that blindness is diminishing, while the number of deaf mutes is rather increasing.—*N. Y. Evening Post.*

Classification of Epilepsy.—Dr. Frederick Peterson, President of the Board of Managers of the Craig Colony of Epileptics, has the following to say in his third annual report regarding the classification of this disease: "So little is known of the etiology of epilepsy that it is not possible, in the light of present knowledge, to make a satisfactory classification of its forms. The terms grand mal, petit mal, psychic and Jacksonian are largely symptomatic designations, and bear little relation to causative factors. A classification based strictly on etiology is not possible, but none will deny that such a classification would be more scientific and valuable. The classification here offered is not held to be perfect or even satisfactory, but is used as a working basis for future improvement: 1, genitoneuropathic; 2, post-paralytic; 3, traumatic; 4, hystero-epilepsy; 5, hereditary; 6, imbecilic; 7, acquired; 8, senile."

Limit to Power of Health Officers.—The question was presented in the case of Eckhardt v. City of Buffalo, whether, under a general power to declare certain matters and things to be nuisances, and to abate the same in such manner as the official may deem expedient, the power may be implied to cause new erections to be made, new appliances, apparatus and contrivances to be used and new improvements to be adopted, all in accordance with supposed scientific principles of sanitation, and to charge the expense, however costly it may be, to the landowner, whether he will or no? This, the fourth appellate division of the supreme court of New York answers in the negative. Or, to be more specific, the court holds that a health commissioner, given by statute only power to abate nuisances, has not the right or power to force on a landowner the mechanical contrivance of water-closets, with all their requisites and accessories, instead of privies, which, sufficient as privies, if kept in the condition proper for such conveniences, are on his lands for the purposes of his building there. No such extensive powers exist at common law. The conservation of public interests and the people's health and safety, says the court, must be looked to, but at the same time private rights of property must be guarded and protected against unwarrantable invasion, and the undue exercise of authority must be restrained within reasonable and proper bounds. The fact that a privy may not conform in all its appointments and accessories to the most approved modes of scientific sanitary plumbing does not of itself condemn it as a nuisance. Besides, the right to abate is limited to the removal of that in which the nuisance consists. Nor does the court think that the existence of Asiatic cholera in the seaports of Europe, having connection with the city of Buffalo, N. Y., would put inhabitants of the latter place in great and imminent peril, such as to warrant the health commissioner compelling them to incur large expenses in the improvement of their property, far beyond what the ordinary exigencies or necessities would require.

Danger from Gauze Tampons in Postpartum Hemorrhage.—Schaeffer regards with disfavor the use of gauze as a material for uterine tampons in cases of flooding. If impregnated with iodoform or some other antiseptic, there is no danger of sepsis. If, however, it should happen, as is often the case, that the tampon fails to stimulate uterine contractions, and if when the bleeding is from a lacerated cervix the plug does not cause the torn artery to close by thrombosis, the gauze increases the danger, for it acts as a capillary drain and takes up much blood. All who have attended many labors know that the tolerance of hemorrhage is very irregular in different subjects, and an apparently trifling loss will kill certain women. Hence, the best rule in flooding is not to allow one drop more to be shed, if possible. Gauze, above all, if "absorbent," which simply means more absorbent than commoner material, at least takes up many drops of blood. Schaeffer now uses non-absorbent gauze, prepared by impregnating it with gutta-percha. It can be mixed with iodoform or airol. By rolling it up into a ball it can be passed into the uterus, which it distends without absorbing any more blood. As a tampon the gutta-percha gauze retains its elasticity. Hence Schaeffer finds it suitable for inducing abortion.—*British Medical Journal.*

Carcinoma of the Rectum.—Prof. J. Hochenegg concludes a review (prepared for the Moscow Congress) of his 129 operations for cancer and 173 for other troubles of the rectum, with the remark that we seem now to have reached the limit of what we can do for patients in an operative way, with the exception of locating and removing affected lymphatics as in carcinoma of mamma. He found the glands involved in far more than half of his cases. Future progress will be in earlier diagnosis, as surgeons are not to blame for the small percentage of permanent recoveries, the patients being sent to them altogether too late. He rejects the use of the mirror as directly injurious and needless, when the carcinoma is below the sphincter at the edge of the anus, where it can be easily seen; also for carcinoma located in the ampulla, usually in the anterior wall, which is characterized by level, soon ulcerating prominences, spreading later into a ring of infiltration around the whole rectum with a tendency to hemorrhage, slimy diarrheic passages and pain in the lumbar region, the rigid carcinomatous growth holding the lumen open. When located at the sphincter tertius it tends rapidly to a ring formation, with stenosis, violent constipation alternating with diarrhea, and hemorrhage, as fragments of the neoplasm are torn away by some violent evacuation. A specific symptom with this form is the presence of gas in the ampulla, which is very much distended although empty of solid contents. The sensation to the investigating finger is that of a gas-filled balloon. Irrigation, etc., liberates the gases but the condition recurs again in two to three hours, and is a characteristic indication of this form of carcinoma, which is very deceptive to palpation. One day it feels like a solid body projecting into the gas-filled ampulla like the vaginal portion of the uterus into the vagina; another day, after an evacuation usually, it is not to be felt at all. The amount of water that can be injected is an unreliable method of locating the stenosis. A better means is Otis's improved endoscopy, which requires care and experience. There are no typical carcinomatous feces. Mucus merely indicates catarrh, and hemorrhage before, during or after an evacuation may be produced by hemorrhoids. Microscopic investigation also fails to reveal cancerous particles in most cases, and the pains at first are too slight to drive the patient to the physician. Digital investigation and palpation are therefore the chief if not the sole reliance in diagnosing. Where a pelotte is necessary after an operation, he orders for his hospital patients a large sponge, wet and well wrung out, held by an elastic band. In eighty-nine extirpations by the sacral method, since 1887, thirty-two are still living without a relapse, five with relapse, thirty-three died from relapse, seven from an intercurrent disease and four have been lost track of. In two cases there have been normal pregnancies and deliveries. The article is published complete in the *Wien. Klin. Woch.* of August 12.

Constitutionality of Laws Regulating Practice of Medicine.—Under the civil law no barriers were drawn around either professions of law or medicine. Any one who pleased might practice them without any previous qualification, subject always for injuries inflicted upon others. The common law, having an habitual regard for the widest freedom of action and borrowing from the civil law, always favored the right of any man to practice in any profession or business in which he was competent. It was a right inherent in every man to practice the art of medicine. But in modern times the tendency of legislation is to prescribe qualifications for the practice of the professions of law and medicine. Its competency can not be successfully impugned. Learning and good moral character may be required as a condition to the exercise of the rights to practice them. A law enjoining reasonable requirements as to learning and character is simply an exercise of the police power. This power may be exercised in barring from admission those who apply for the right to practice the profession of medicine, and also in excluding those who have been practicing it. Such legislation is justified by the safety of the lives, health and comfort of the people, which is the supreme law. In no case is the practice of medicine a property right. Nor is it a vested right. But it is a valuable right; and no one can, arbitrarily and without reason, be deprived of it. Such is the general statement made by Judge Pugh of the court of common pleas of Franklin county, Ohio, in the case of State v. Ottman, where he holds the law of that State passed February, 1896, entitled "an act to regulate the practice of medicine," constitutional. That it authorizes the medical board to refuse to grant or to revoke a certificate to practice "to any person guilty of felony or gross immorality," he does not consider in violation of the provision of the constitution of the United States which prohibits the passage of any *ex post facto* law or bill of attainder, though it was argued that this was a deprivation of a civil right for past conduct. Neither does he think that it violates the provision which ordains that the citizens of each State shall be entitled to all privileges and immunities of citizens of the several States; nor anything in the fourteenth amendment; nor the constitution of the State, especially in its provisions as to appeals.

Cheap Sanatoria for Consumptives.—Unterberger in the *St. Petersburger med. Wochenschrift* argues that the part played by the bacillus of tubercle in the spreading of the infection of phthisis has been over-estimated. He refers to Riffel's case as a case in point, namely, the instance of a consumptive family occupying for thirty years a small house; several children and five adults died of phthisis in the house. The house was then immediately occupied by another (large) family, and although no kind of disinfection had been undertaken and many years have elapsed, none of the second family have yet developed phthisis. As an instance of what he means by the cure of phthisis, Unterberger narrates the history of Dr. Dettweiler. This physician, aged 58 years, has a family history of phthisis. At 17 years of age (1859) he had chronic pleurisy on the right side; hemoptysis in 1860. In 1867 there were signs of a cavity at the apex of the right lung and much hemoptysis. In 1868 he improved during treatment at Goerbersdorf, but had an attack of pleuropneumonia after giving lectures at Darmstadt. He then became assistant to Brehmer at Goerbersdorf. In May, 1870, he had severe typhlitis, and then, during service in the Franco-German war, had fresh hemoptysis and pulmonary inflammation. After six weeks' rest at Goerbersdorf he was able to return to the war, but on the way back from France had again the signs of a cavity at the right pul-

monary apex. He remained at Goerbersdorf, improving slowly, but had an exacerbation in 1875. In this year he went over to Falkenstein, where he has had occasionally hemoptysis or fever, and in 1883 a left pleuritic exudation. In 1884 no tubercule bacilli could be found in the sputum, but after a fresh cold they were again present. Since 1885 no bacilli have been found in the sputum, although there have been occasional slight hemorrhages. He also treats of the experiments that have been made in Europe in organizing simple and cheap sanatoria for phthisic patients. In Russia there are two such sanatoria; Halila in Finland founded by Dittmann in 1883, and Lindheim in Livonia founded by Trew in 1895. The great expense hinders the erection of many large sanatoria, but he maintains that little houses or cottages might be erected at less expense, where consumptive patients might have pure country, dust-free air, good food and hydrotherapeutic treatment and remain under medical supervision as at larger sanatoria. The air may be artificially scented with the aroma of pine trees if the latter are insufficient. With Winternitz he believes that the hydrotherapeutic processes act by increasing phagocytosis. Employers of labor might even be induced to erect small sanatoria of this kind from purely economic considerations.—*British Medical Journal.*

Longevity a Feature of Temperate Climates.—During 1896 the death of 188 persons over 90 years of age, fourteen of them being over 100, was recorded in Great Britain and Ireland. It is a somewhat curious circumstance that the average longevity is greater in Scotland than it is in England, and greater in Ireland than in Scotland, the birth-rate being largest in England and least in Ireland. Of a thousand persons, men, women and children, resident in England, the average number over 60 years of age is seventy-two or somewhat more than 7 per cent. In Scotland the proportion over 60 years of age is 7.7 per cent., and in Ireland it is 10.5 per cent. Ireland stands second to France as regards the longevity of its inhabitants, the proportion of men and women in France over sixty years old being by the last census 12.7 per cent., or 127 of each 1,000 of population. The official figures of the census report show that longevity is, to a considerable extent, regulated by climate, that is, in countries within the temperate zone, the duration of life is greater than in warmer or semitropical countries. The average number of persons over 60 years old in 1,000 inhabitants in the United Kingdom is seventy-seven, and in the German Empire, the climate of which is similar, it is the same. In Holland it is also seventy-seven; in Denmark, eighty-four; in Sweden, eighty-eight, and in Norway, ninety. In Russia the longevity of the inhabitants is greatest in the northern provinces and lowest in the southern ones. The average of European countries in the north temperate zones, England, Germany and Holland, seventy-seven a thousand falls to seventy-one in Austria and in Portugal. In Spain, where the climate is generally milder than in Portugal, the number over 60 years of age, in a thousand, is fifty-eight only, and in Greece it is fifty-six. In the East Indies, as far as there are any authentic figures, the average is only forty in a thousand inhabitants. In South America the average is about fifty, though there are, of course, many exceptional cases.

The Surgical Attributes of the Southern Negro.—Dr. Rudolph Matas, of the Charity Hospital of New Orleans, has made a very thorough statistic study of the records of that hospital as to the surgical peculiarities of the negro of Louisiana. His research, which covers a period of ten years ending 1894, has warranted the conclusion that the race of the patients play little or no part in the prognosis of surgical operations, except in so far as it is influenced by degenerative tendencies due to the hygienic, social and moral environment. He holds the opinion that the colored man of his section is at nearly all points, whether anthropologically, physiologically and pathologically, different from his original African ancestors and from his uncivilized brothers on the west coast of Africa of the present generation. A residence of nearly three hundred years in the southern States of North America, in contact with the white man and under the influence of civilization, has produced a marked change in the mental and physical organization of the negro. This change is evidently due to the combined influences of acclimatization and adaptation to surroundings, and especially miscegenation with the white race. The *International Journal of Surgery* weighs the argument of Dr. Matas and with him concedes that the general morbidity and mortality of the colored race was less than that of the white population in the South, during the whole period of slavery and up to emancipation; but concludes that since the colored race has been thrown upon its own resources, its morbidity and mortality have enormously increased, and are now much greater than those of the white population. While the more typical African diseases are rapidly disappearing, the general liability of the negro to the common diseases of this country is rapidly increasing, so that many immunities which he formerly enjoyed have been lost, and new predispositions to disease have been acquired. There are no conditions, continues the author, which prevail exclusively in the colored race, any more than there are diseases which prevail exclusively in the white race. The differences, pathologically speaking, that do exist between the white and colored population, lie only in their relative predispositions to some of the diseases that prevail in this country, and in their relative immunity from others. When viewed from the purely surgical operative standpoint, the white and colored races are practically alike, especially when individuals of both races, taken from the same social environment, are compared. There are no apparent differences between the races on the operating table; the same technique applies to both equally as well, and often, especially in the matter of resistance to shock, the negro appears to better advantage than the white man. In the general and local reactions of the tissues to infection, there are some differences in the races. It is in the histogenetic tendencies of the tissues that we find the real surgical contrast between them. If we are to judge from this alone, the colored race reveals in this last particular a marked tendency to degeneration.

English Governmental Report on Glycerinated Vaccine.—The researches of Sir R. Thorne Thorne, M.D., and Dr. Copeman, upon the newer preparations of bovine vaccine, have been reported to the Local Government Board. These reporters visited Paris, Berlin, Brussels and several other cities of central Europe in order to investigate the laboratories where the glycerination of vaccine lymph has been conducted on an extensive scale. Since 1891, Germany especially has been engaged in perfecting a system of vaccination in which the English method of arm-to-arm operations plays no part, and these reporters state that in that nation the laboratories have found it possible to obtain from a single calf sufficient vaccine to vaccinate 6,000 to 15,000 individuals. Whereas, says the *Lancet*, the English governmental vaccine establishment has been content to obtain 200 or 300 vaccinations from each animal operated upon for lymph production. These reporters brought back with them from Berlin a quantity of the glycerinated and most highly diluted lymph and made test vaccinations after intervals of nine to thirty-seven days after collection, and obtained a success of 92 per cent. in their series of seventy-six individuals. With other samples less highly diluted with glycerin there were obtained successes in 100 to 97 per cent., when the lymph had not been subject to a longer interval after collection than thirty-one days. Not only is the activity of the lymph not impaired by the addition of very considerable proportions of glycerin, but this latter agent exerts a distinct bactericidal effect on organisms that accidentally find their way into the vaccine, inclusive of the pus producing

germs, which are more or less resistant to many bactericidal agents other than glycerin. Lymph containing an aqueous solution of glycerin has also been experimentally proved to have the property of destroying the vitality of the bacillus of tuberculosis. It is not in terms stated that the glycerinated lymphs were found to be sterile, but that they did not contain those pathogenic forms that may possibly produce erysipelas, suppuration and tuberculosis, the three conditions that have been said to be possibly communicable by the use of the non-glycerinated bovine virus. Economy and a greater safety both point the same way, namely, to the use of glycerin in the preparation and storage of vaccine. The proportion of glycerin added in the different laboratories varies greatly. In Paris the lymph is diluted with equal parts of the agent; in Brussels about two parts thereof are added; in Berlin fourteen parts of a solution of equal parts of glycerin and boiled water are added to one part of the epithelial pulp scraped from the vesicles. These differences can only be settled to the satisfaction of the profession and of interested officials by continued laboratory work, and the reporters point out the necessity for the prompt establishment, in England, of a home laboratory to aid in the settlement of this and allied problems. The question of the centrifugalization of the lymph has been experimented upon in Berlin, but the desirability of this additional measure of purification has not been demonstrated. It is true that the vaccine has a better appearance and shows a smaller amount of microorganisms, even before the addition of the solution of glycerin, but it is argued that if the activity of the lymph depends upon a particular body "and is locked up specially in the epithelial cells, continued centrifugalization would remove it and the lymph would lose its activity." This is another phase of the question that can only be cleared up by laboratory work. In some of the laboratories the tuberculin test is applied to the calf. In others of the places the reliance as against possible tuberculosis in the animal is placed in the postmortem. The selected animal is closely followed from the time of purchase until that of slaughter. This latter is done in the presence of experts and none of the collected lymph is allowed to leave the establishment until after a thorough examination has been made upon the producing animal and it has been pronounced to be free from tuberculosis.

Bites of Insects and Serpents.—Dr. Gonin of Lyons, sends a note to the Paris Academy of Medicine recommending formol for mosquito and gnat bites, also for bites from small animals. The bites should be covered with formol by a small brush or the surface of the cork of the bottle containing it. After evaporation the formol is again applied. The soothing effect is instantaneous; there is never any inflammation. M. Gonin asserts that formol is efficacious for serpent and scorpion bites.

Hospitals.

THE VIRGINIA HOSPITAL and the Richmond (Va.) Male Orphan Asylum each received $10,000 from the late Major Lewis Ginter. St. Luke's Home for the Sick, the Sheltering Arms Hospital and the Richmond Eye and Ear and Throat Infirmary each receive $5,000, while $2,500 goes to Maternity Hospital and $1,000 to Foundling Hospital.——The cornerstone of the new Jamaica (L. I.) Emergency Hospital was laid, with appropriate ceremonies, October 9.

Societies.

The following meetings are noted:

Connecticut.—New Haven Medical Association, October 6.

District of Columbia.—The Alexandria Medical Society, October 6.

Illinois.—Clinton County Medical Association, Clinton, October 5. Medico-Legal Society, Chicago, October 14.

Iowa.—Dubois County Medical Association, October 1. Iowa State Medical Association, Des Moines, October 13 and 14. Polk County Medical Association, Des Moines, October 12.

Kentucky.—The Kentucky Medical Association, Richmond, October 8. Southern Medical Association, Bowling Green, November 3 and 4.

Michigan.—Saginaw Medical Society, Saginaw, October 6.

Minnesota.—Minnesota Academy of Medicine, Minneapolis, October 6.

Missouri.—Southwest Missouri Medical Society, Springfield, October 14 and 15.

New York.—Broome County Medical Society, Binghamton, October 5. New York State Medical Association, New York City, October 13, 14 and 15.

Ohio.—Association of Surgeons of the Pennsylvania Railroad Company, Zanesville, October 12. Clark County Medical Society, Springfield, October 7. Columbus Academy of Medicine, October 4. Pickaway County Medical Society, Circleville, October 6.

Pennsylvania.—Luzerne County Medical Society, Wilkesbarre, October 6.

Tennessee.—American Association of Colored Physicians, Nashville, October 15. East Tennessee Medical Society, Knoxville, October 5. Tri-State Medical Society, Nashville, October 12, 13 and 14.

Utah.—State Medical Society, Salt Lake City, October 5.

Wisconsin.—Northwestern Wisconsin Medical Association, Marshfield, October 12.

Ontario, Canada.—Chatham Medical and Surgical Society, October 7.

Washington.

HEALTH OF THE DISTRICT.—The report of Health Officer Woodward for the week ended October 9, shows the total number of deaths to have been 97, of which number 51 were white and 46 colored. There were 16 deaths from diseases of the nervous system; 7 of the circulatory; 7 from diseases of the kidney; and 19 from diseases of the respiratory system. There were 5 cases of fatal diphtheria and 3 of typhoid fever.

CENTRAL DISPENSARY AND EMERGENCY HOSPITAL.—At the meeting of the Attending Staff recently held, the resignation of Dr. George Byrd Harrison was received and accepted. The Staff tendered him a vote of thanks for his faithful and efficient services and expressed regret at his severing his connection with the institution. Dr. Harrison was director of the clinic of General Medicine, Skin and Venereal Diseases. Dr. Hawkes, who has been traveling in Europe for the past several months, has returned and assumed charge of his department in the Hospital.

PUBLIC HEALTH COMMITTEE.—A meeting of the Public Health Committee of the Washington Board of Trade was called to order on October 13, by the president, Dr. Samuel C. Busey, for the purpose of preparing the annual report for the year 1897. The principal recommendations, unanimously agreed to, and earnestly recommended, were the reclamation of the Anacostia Flats (Washington's Black Hole of Calcutta), the sewage disposal and water purification bills.

MEDICAL SOCIETY.—At the regular meeting of the Society, held October 13, Dr. Claytor held a scientific and instructive paper entitled "A contribution to arhythmia of the pulse and its significance." The subject was made further interesting by the exhibition of charts explanatory of the subject. Dr. D. S. Lamb presented some very interesting specimens and gave the histories of hemorrhage into the spinal cord, and human bones excavated from mounds in Florida, demonstrating pre-Columbian syphilis.

WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.—The annual meeting of the Washington Obstetrical and Gynecological Society was held on October 15, at the residence of Dr. Magruder, a retired member of the Society. The election of officers for the ensuing year resulted as follows: President, Dr. Thomas C. Smith; vice-presidents, Drs. H. L. E. Johnson and John T. Winter; recording secretary, Dr. J. Thomas Kelly, Jr.; corresponding secretary, W. Sinclair Bowen. The following committees were formed: Business, Drs. Winter, Tompkins and Bowen; admissions, Drs. Spragg, Deale and Cuthbert; publication, Drs. Cook, Deale and Kelly. A banquet at the Arlington closed the evening's program.

Detroit.

AT THE THIRTY-SECOND ANNUAL MEETING of the Wayne

County Medical Society, held Oct. 7, 1897, the following officers were elected: President, L. E. Maire, M.D.; vice-president, A. H. Steinbrecher, M.D.; secretary, J. H. Sanderson, M.D.; treasurer, C. H. Leonard, M.D.; board of directors, Drs. R. Hislop, R. H. Honner, Dayton Parker, J. A. Patton, C. D. Aaron. The secretary reported the society in a flourishing condition, with a membership of 211.

THE DETROIT MEDICAL AND LIBRARY ASSOCIATION at its regular meeting, Oct. 11, 1897, listened to an interesting paper by Charles D. Aaron entitled "Intestinal Auto-intoxication," in which the author made the statement that the meaning of auto-intoxication was not yet definitely agreed upon, but that it consisted of the retention of normal and abnormal material in the intestines, the result of which is decomposition, putrefaction and fermentation, and that the products of the carbohydrate fermentation gives formic, butyric, lactic and acetic acids, with gases, etc. In albuminous decomposition we get NH_3, leucin, tyrolin, cystin, phenol, indol, skatol, tyrosin, acetan, etc. He alluded to the fact that a great number of microbes within the intestinal canal generate poisonous ptomains and toxins, which are quickly absorbed, and that when we get this production with the retention in the intestinal tract certain symptoms which show a condition of the digestive, respiratory, circulatory, uropoietic and nervous systems takes place. While there is no proof that this is due to auto-intoxication, yet it is certain that when these poisons are removed the different symptoms disappear. In vertigo we have a symptom which shows itself in the poisoning due to alcohol, nicotin, etc., also headache, neuralgia and vomiting due to cerebral retention. The author stated that constipation was not always necessary in auto-intoxication and said that the more fluid-like the contents of the intestines were the more rapid were the absorption of the toxins, as the urine in diarrheic condition has been found to be quite poisonous, and that patients in a condition of auto-intoxication feel better when constipated than when they have frequent evacuations. He also stated that in cholera patients the absorption of toxins is kept up even when there is frequent evacuations. He cited the digestive disturbances of children, which he claimed could be more easily explained on the lines of auto-intoxication than on the reflex theory, and said that such disturbances of the circulation as tachycardia and other symptoms of vasomotor disturbances are very often due to intestinal auto-intoxication. In certain skin affections as urticaria, this matter is not now recognized as being due to idiosyncrasy, but rather to the intestinal auto-intoxication. He also argued that asthmatic dyspepsia, symptoms of collapse produced by obstruction of the bowel and sclerosis, depended somewhat upon auto-intoxication.

CHANGE OF ADDRESS.

Alford, R. Lee, from Laddonia to Vandalia, Mo.
Allen, W. H., from Horr to Joliet, Mont.
Billig, A., from 360 E. 32d St. to 3310½ Rhodes Ave., Chicago, Ill.
Boyer, E. N., from Missouri House to 601½ Hamp St., Quincy, Ill.
Claussen, J. E., from Ware Bldg to 2205 Cuming St., Omaha, Neb.
Clark, M. S., from 13 W. Federal St. to 213 Mill St., Youngstown, Ohio.
De Witt, T. B., from 1609 Jackson Boul. to 1643 Polk St., Chicago, Ill.
Davis, W. M., from Blackfoot, Texas, to 311 E. Madison St., Louisville, Ky.
Dion, D., from 376 Bowen Ave. to 98 Eighteenth St., Chicago, Ill.
Fulke, Joseph, from Buckingham, Pa., to 1709 Race St., Philadelphia.
Horwitz, O., from 1115 to 1721 Walnut St., Philadelphia, Pa.
Kneedler, W. L., from 2003 D St. to San Diego Barracks, San Diego, Cal.
Kaszcynski, J., from 638 Noble St. to 19th St. and Hoyne Ave., Chicago.
Knerr, C. B., from 858 to 1710 E. Washington St., Indianapolis, Ind.
Lehan, J. W., from Aurora, Iowa, to 427 Congress St., Chicago, Ill.
Nolan, E. C., from Mt. Pulaski to 6060 State St., Chicago, Ill.
Oren, S. A., from Lanark, Ill., to Laporte City, Iowa.
Page, J. F., from Mystic, Iowa, to Bellevue Hospital Medical College, New York, N. Y.
Piper, J. R., from Mansfield, Ohio, to 429 Prospect St., Cleveland, Ohio.
Steadman, T. E., from 329 Amsterdam Ave. to 53 E. 56th St., New York.
Sadtler, C. E., from 1839 to 1800 Bolton St., Baltimore, Md.
Weitz, J. A., from Montpelier, Vt., to 569 Third Ave., Detroit, Mich.
Warden, A. W., from 130 W. 104th to 118 W. 82d St., New York, N. Y.
Wolfender, J. N., from 1102 N. Halsted St. to 749 Evanston Ave., Chicago, Ill.

LETTERS RECEIVED.

Alkire, J. P., Columbus, Ohio; Abbott, E. H., Chicago, Ill.
Blodgett, F. J., New York, N. Y.; Breedlove, J. W., Fort Smith, Ark.; Battle & Co., St. Louis, Mo.; Brown, A., Aniwa, Wis.
Curry, C. J., Horubeak, Tenn.; Cresweil, G. H., Arvado, Wyo.; Consumers' Company, The, Chicago, Ill.
Etheridge, J. H., Chicago, Ill.; Edson, Carroll E., Denver, Colo.; Eason, J. T., Grand Lake, Ark.
Foster, Burnside, St. Paul, Minn.
Holland, J. W., Philadelphia, Pa.
Jones, Asa, Flemington, N. J.
Kelley, Maus & Co., Chicago, Ill.; Kneedler, W. S., San Diego, Cal.; Knopf, S. A., New York, N. Y.
Little, C. H., Piqua, Ohio.
Montgomery, L. H., Chicago, Ill.; Munson, E. L., Fort Assiniboine, Mont.; McReynolds, J. O., Dallas, Texas; Martin, Thomas Charles, Cleveland, Ohio; Mattison, J. B., Brooklyn, N. Y.
Newell & Heidman, Chicago, Ill.; Nelson, H. S., Minneapolis, Minn.; Nixon, J. W., Soldier, Kan.
Ohlmacher, A. P., Gallipolis, Ohio.
Pantagraph Printing Co., Bloomington, Ill.; Porter, W. D., Cincinnati, Ohio.
Snyder, D. J., Scio, Ohio; Steele, D. A. K., Chicago, Ill.; Shilling, G. W., Sharon, Pa.; Sander, Enno, St. Louis, Mo.
Ulrich, C. F., Wheeling, W. Va.
Wilcox, R. W., New York, N. Y.

PAMPHLETS RECEIVED.

An Inheritance for the Waifs. By C. F. Taylor, M.D. Paper, 8 pages. Philadelphia.
An Operation for the Correction of a Saddle-back Deformity of the Nose; Two Cases of Abscess of the Nasal Septum: A Modification of Horner's Mastoid Retractor. By E. C. Ellet, M.D. Reprints.
Auditory Aphasia. By H. T. Pershing, M.D. Paper, 16 pages. Reprinted from Jour. of Nervous and Mental Disease.
Early History of Ophthalmology and Otology in Baltimore (1800-1850). By Harry Friedenwald, A.B., M.D. Paper, 20 pages. Reprinted from Johns Hopkins Hosp. Bulletin.
Four Lectures on the Sympathetic Nervous System. Paper, 148 pages, illustrated. By G. Carl Huber, M.D. Reprinted from Jour. of Comp. Neur.
Joseph Friederich Peringer: His Methods and Investigations. By G. Carl Huber, M.D. Paper, 16 pages. Reprinted from Johns Hopkins Hosp. Bulletin.
Notes on Suicide. By C. C. Mapes. Paper, 16 pages. Reprinted from The Medical Age.
Ovariotomy in a Child Thirty-three Months Old. By C. S. Hoffman, M.D. Paper. Reprinted from Am. Jour. of Obstetrics.
Physical Proportions of the American Soldier. By Major H. S. Kilbourne. Paper, 12 pages. Columbus, Ohio: Berlin Printing Company, 1897.
Resorcin in Dermotherapy, Histologic Researches Upon its Action on the Healthy Skin. By James C. Kellogg, M.D. Paper, 16 pages. Illustrated. Reprinted from St. Louis Med. and Surg. Jour.
Some Relations of Author, Publisher, Editor and Profession. By George M. Gould, M.D. Paper, 12 pages. Reprinted from Bulletin of Amer. Acad. of Med.
Structure and Function of the Tube and Loop of Henle. By Rosalie Ladolf. Paper, 8 pages. Reprinted from Medical Standard.
A Case of Pyemia in a Young Infant. By John C. Da Costa, M.D. Paper, 5 pages. Reprinted from American Journal of Obstetrics.
A Criticism of Modified Milk and of Modern Dairy Methods; Personal Observations on Effects of Changes of Climate upon Men and Animals. By Richard Cole Newton, M.D. Reprints.
Medio-Bilateral Lithotomy; Operative Indications in Appendicitis; Report of Operations at Private Surgical Infirmary, 1896-97. By Charles S. Briggs, M.D. Reprints.
Morphinism; Diagnosis of Morphin Disease; Post active Treatment of Narcotic Habitués. By J. B. Mattison, M.D. Reprints.
New Mexico Medical Society; Report of Sixteenth Annual Meeting. Paper.
Streptococcic Infection and Marmorek's Serum. By George W. Cox, M.D. Paper, 18 pages. Reprinted from Journal of American Medical Association.
Surgical Clinic. By F. C. Schaefer, M.D. Paper, 8 pages. Reprinted from Chicago Clinical Review.
The Treatment of Malaria. By Judson Daland, M.D. Paper, 16 pages. Reprinted from International Clinics.

THE PUBLIC SERVICE.

Navy Changes. Changes in the Medical Corps of the U. S. Navy for the two weeks ending October 16, 1897.

Medical Inspector J. C. Wise, P. A. Surgeon F. A. Hesler, Asst. Surgeon B. K. Smith, detached from the "Philadelphia" and ordered to the "Baltimore."
Medical Director N. L. Bates, detached from the Museum of Hygiene and ordered to duty as chief of the Bureau of Medicine and Surgery.
Medical Director J. R. Tryon, detached from the Bureau of Medicine and Surgery and ordered to New York as general inspector of United States naval hospitals.
Medical Inspector H. J. Rabin, ordered as president of the naval examining board, New York, October 9.
Medical Director C. H. White, detached as president of naval examining board, New York, October 9, and ordered to Washington in charge of Naval Museum of Hygiene.
Asst. Surgeon J. C. Pryor, detached from the naval hospital, Mare Island, and ordered to the "Adams."
Asst. Surgeon A. Farenholt, detached from the "Vermont" and ordered to New York navy yard.
Surgeon C. G. Herndon, ordered on temporary duty at the Naval Museum of Hygiene.
Asst. Surgeon W. B. Grove, detached from naval laboratory, New York, and ordered to Mare Island hospital.
P. A. Surgeon C. P. Bagg, detached from the "Marion" and ordered to the "Adams."
Asst. Surgeon M. K. Johnson, detached from the "New York" and ordered to duty with the "Vicksburg."
Asst. Surgeon R. Spear, detached from the naval laboratory, New York, and ordered to the "New York."
Surgeon C. Biddle, detached from marine rendezvous, San Francisco, ordered to Washington in charge of patient, then report at the Navy Department.